Note: Since the original submission of this resource consent application for the Motukawa Hydro-Electric Power Scheme in November 2021, the application has been amended to remove a previously proposed increase in water take from the Manganui River. The technical assessments associated with the application have not been amended to reflect this change, however all effects on the environment will either be the same or less than assessed in those lodged technical assessments.

TRUSTPOWER LIMITED

MOTUKAWA HYDRO-ELECTRIC POWER SCHEME

Applications for Resource Consent and Assessment of Environmental Effects

26 November 2021 (Amended February 2023)

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PART A

Resource Consent Application

FORM 9

APPLICATION FOR RESOURCE CONSENT

Sections 88 and 145, Resource Management Act 1991

To Taranaki Regional Council
Private Bag 713
Stratford 4352

1. Trustpower Limited apply for the following types of resource consent:

All necessary resource consents to authorise the operation and maintenance of the Motukawa Hydro-Electric Power Scheme ("**HEPS**") in the Manganui River catchment, including, but not necessarily limited to:

- A water permit for the damming of water in the Manganui River via an existing diversion weir and intake structure;
- A water permit for the diversion, take and use of water from the Manganui River for hydro-electricity generation purposes;
- A land use consent for the use and maintenance of an existing diversion weir, intake structure and fish passes in the bed of the Manganui River;
- A discharge permit for the discharge of water and contaminants over and through an existing diversion weir and fish passes located in the bed of the Manganui River;
- A discharge permit for the discharge of water and contaminants to the Manganui River via an existing sluice gate;
- A water permit for the damming of water in the Motukawa Race via an existing small weir;
- A water permit for the diversion, take and use of water from the Motukawa Race for hydro-electricity generation purposes;
- A discharge permit for the discharge of water from the Mangaotea Aqueduct into the Mangaotea Stream;
- A water permit for the diversion and use of stormwater runoff and flows from various unnamed watercourses that drain into the Motukawa Race and Lake Ratapiko for hydro-electricity generation purposes;
- A water permit for the damming of the Mako Stream via an existing dam;

- A land use consent for the use and maintenance of an existing dam and spillway structures in the bed of the Mako Stream;
- A water permit for the discharge of water from Lake Ratapiko via the existing spillway structures and drainage valves;
- A land use consent for the disturbance / dredging of the bed of Lake Ratapiko for maintenance purposes;
- A discharge permit for the discharge of water from an existing surge chamber during maintenance periods to an unnamed tributary of the Makara Stream; and
- A discharge permit for the discharge of water from the Motukawa Power Station to the Makara Stream.

2. The activity to which the application relates (the proposed activity) is as follows:

Trustpower Limited is seeking all necessary resource consents from the Taranaki Regional Council for the continued operation, use and maintenance of the Motukawa HEPS.

The Motukawa HEPS is located east of State Highway 3, and approximately 15 km southeast of Inglewood and 26 km southeast of New Plymouth. The Scheme diverts water from the Manganui River, via the Motukawa Race, to Lake Ratapiko. From Lake Ratapiko, water is diverted to the Motukawa Power Station (located on Motukawa Road) and discharged back into the Makara Stream (a tributary of the Waitara River).

The Motukawa HEPS has an installed generation capacity of 5 MW and generates approximately 22 GWh of electricity per annum. The Motukawa HEPS connects to Powerco's electricity distribution network in the Taranaki Region.

3. The sites on which the proposed activities are to occur are as follows:

The sites on which the structures and infrastructure associated with the Motukawa HEPS are located, are summarised in the table below, with the applicable Records of Title appended to the attached Assessment of Environmental Effects.

Component of the Motukawa Hydro-Electric Power Scheme	Landowner	Legal Description	Record of Title
Manganui River diversion weir	Crown	Manganui River	-
Western reach of the Motukawa Race (including the Silt Pond)	Trustpower Limited	Lot 6 Deposited Plan 476547	692933

Component of the Motukawa Hydro-Electric Power Scheme	Landowner	Legal Description	Record of Title
Land parcel immediately east of the Silt Pond	Trustpower Limited	Lot 4 Deposited Plan 476547	658748
Section of the Motukawa Race that passes under Tariki Road South	New Plymouth District Council	Tariki Road South	-
Middle reach of the Motukawa Race	Trustpower Limited	Subdivision 2-3 Section 2 Block V Huiroa Survey District, Subdivision 1-2 Section 25 Block VI Huiroa Survey District and Subdivision 2-3 Section 27 Block VI Huiroa Survey District	TN116/138
		Lot 1 Deposited Plan 10436	TNC2/714
		Lot 2-3, 5 Deposited Plan 7088 and Lot 2 Deposited Plan 16055 and PT Section 32-34 Block VI Huiroa Survey District	TNH3/504
	Kenneth Watchorn	Section 32-34 Block VI Huiroa Survey District (this section has two owners and as such is also included above under the ownership of Trustpower)	TN78/157
Section of the Motukawa Race that passes under Salisbury Road	New Plymouth District Council	Salisbury Road	-
Section of the Motukawa Race that passes under Mangaotea Road	New Plymouth District Council	Mangaotea Road	-
Eastern reach of the Motukawa Race	Trustpower Limited	PT Section 31 Block VI Huiroa Survey District, Subdivision 2 Section 4S Block VI Huiroa Survey District and Lot 1 Deposited Plan 16055	TNH3/502

Component of the Motukawa Hydro-Electric Power Scheme	Landowner	Legal Description	Record of Title
Lake Ratapiko	Trustpower Limited	Subdivision 1 Section 4S Block VI Huiroa Survey District	TNH3/502
		PT Section 5S Ratapiko Settlement	TNC3/1303
		Lot 1 Deposited Plan 20318	TNL1/865
		Lot 1 Deposited Plan 20319	TNL1/867
		Lot 1 Deposited Plan 1859	TN50/119
		Lot 1 Deposited Plan 4859	TN117/91
		Subdivision 1 and Subdivision 3 Section 52 Block VI Huiroa Survey District, Subdivision 2-5 Section 54 Block VI Huiroa Survey District, Subdivision 1 Section 60 Block VI Huiroa Survey District, Subdivision 1 Section 5 Block VII Huiroa Survey District and Subdivision 1 Section 7 Block VII Huiroa Survey District	TN117/236
		Subdivision 1-2 Section 53 Block VI Huiroa Survey District and Subdivision 1 Section 54 Block VI Huiroa Survey District	TN116/142
Lake Ratapiko Intake Tunnel	Donald Hugh McIntyre, Linda Christina McIntyre	Lot 4 Deposited Plan 6082	TN152/93
	Barbara Alison Hann, VBW Trustees 2013 Limited	Lot 2 Deposited Plan 6082	TNJ1/7
	A R Hann Trustee Limited, John David	Section 6 Block VII Huiroa Survey District	TND1/480

Component of the Motukawa Hydro-Electric Power Scheme	Landowner	Legal Description	Record of Title
	Hann, Leonard Gordon Hann		
	Kaye Margaret Corlett, Kohete Trustees Limited, Lawson Bernard Corlett	Section 2 Block VII Huiroa Survey District	TNE3/618
	Kenneth Myles Twaddle, Shane Free Longstaff	Section 3 Block VII Huiroa Survey District	TNF2/224
Section of the Intake Tunnel that passes under Kupara Road and Miro Road	New Plymouth District Council	Kupara Road and Miro Road	-
Penstocks and the Motukawa Power Station	Trustpower Limited	Subdivision 1-6 Section 14 Block VII Huiroa Survey District	TN116/143

4. **The full name and address of each owner or occupier (other than the applicant) of the site to which the application relates are as follows:**

- New Plymouth District Council;
- Kenneth Watchorn;
- Donald Hugh McIntyre, Linda Christina McIntyre;
- Barbara Alison Hann, VBW Trustees 2013 Limited;
- A R Hann Trustee Limited, John David Hann, Leonard Gordon Hann;
- Kaye Margaret Corlett, Kohete Trustees Limited, Lawson Bernard Corlett; and
- Kenneth Myles Twaddle, Shane Free Longstaff.

5. **The other activities that are part of the proposal to which the application relates are as follows:**

Those other aspects of the operation and maintenance of the Motukawa HEPS which are permitted activities under the relevant statutory planning documents are described in the attached Assessment of Environmental Effects.

6. The following additional resource consents have been applied for from the New Plymouth District Council:

- A land use consent for the deposition of dredged material (earthworks) onto land adjacent to Lake Ratapiko.

7. I attach an assessment of the proposed activity's effect on the environment that—

(a) Includes the information required by clause 6 of Schedule 4 of the Resource Management Act 1991; and

(b) Addresses the matters specified in clause 7 of Schedule 4 of the Resource Management Act 1991; and

(c) Includes such detail as corresponds with the scale and significance of the effects that the activity may have on the environment.

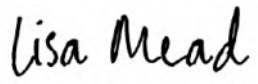
8. I attach an assessment of the proposed activity against the matters set out in Part 2 of the Resource Management Act 1991.

9. I attach an assessment of the proposed activity against any relevant provisions of a document referred to in section 104(1)(b) of the Resource Management Act 1991, including the information required by clause 2(2) of Schedule 4 of that Act.

10. I attach the following further information required to be included in this application by the district plan, the regional plan, the Resource Management Act 1991, or any regulations made under that Act:

- Assessment of Environmental Effects; and
- Appendices:
  - Land Ownership Maps;
  - Records of Title;
  - Hydrology Report – Tonkin & Taylor;
  - Existing Resource Consents;
  - Natural Character, Landscape and Visual Assessment – Boffa Miskell;
  - Aquatic Ecology Assessment of Effects – Ryder Environmental Limited;
  - Sediment Assessment – Tonkin & Taylor;
  - Terrestrial Ecology Assessment of Effects – Ryder Environmental Limited;

- Recreation Assessment – Rob Greenaway & Associates;
- Proposed Consent Conditions;
- Hydraulic and Geotechnical Assessment – Riley Consultants Limited; and
- Effects Management Hierarchy Table.

Signed: 

(by Lisa Mead on behalf of Trustpower Limited)

Dated at Tauranga this 26th day of November 2021

Address for Service: Trustpower Limited
Private Bag 12023
Tauranga 3143

Contact: Lisa Mead

Telephone: 022 318 3946

Email: lisa.mead@trustpower.co.nz

B

PART B

Assessment of Environmental Effects

EXECUTIVE SUMMARY

The Motukawa Hydro-Electric Power Scheme ("**Motukawa HEPS**" or "**Scheme**") is owned by Trustpower Limited ("**Trustpower**") and is located within the Manganui River catchment, southeast of New Plymouth. The Scheme has been in operation for over 90 years and currently generates renewable electricity by:

- Damming and diverting / taking water from the Manganui River via a diversion weir and intake structure;
- The damming and use of water in the Motukawa Race for hydro-electricity generation via an in-race generator;
- The damming of the Mako Stream to form Lake Ratapiko and the regulating of levels in the lake; and
- The diversion / take of water from Lake Ratapiko via a tunnel and penstock for the purpose of hydro-electricity generation at the Motukawa Power Station, and the subsequent discharge of water to the Makara Stream (a tributary of the Waitara River).

The Motukawa HEPS has an installed generation capacity of 5 MW and generates approximately 22 GWh per annum. It connects to Powerco's electricity distribution network in New Plymouth – and thus contributes to security of local electricity supply and the Government's strategic targets for the generation of renewable electricity in New Zealand.

The current resource consents for the Motukawa HEPS were granted by the Taranaki Regional Council ("**TRC**") in 2001 and are due to expire in June 2022. Based upon the annual monitoring reports prepared by the TRC, Trustpower has maintained a high level of environmental compliance performance in relation to the operation of the Motukawa HEPS against the current resource consents.

A number of technical assessments have been commissioned by Trustpower in order to provide an understanding of the potential effects associated with the continued operation of the Motukawa HEPS. These assessments have considered the damming, diversion, take and use of water from the Manganui River via the Motukawa HEPS, and the subsequent discharge of water into the Makara Stream.

The key conclusions from the technical assessments commissioned by Trustpower, and the Assessment of Environmental Effects, are summarised in Table 1 below.

Table 1: Summary of Effects of the Motukawa Hydro-Electric Power Scheme

	Key Conclusions	Mitigation Measures
Positive Effects	The Scheme is an established and reliable generator of renewable electricity in the Taranaki Region, generating approximately 22 GWh of electricity that is embedded into the	N/A

	Key Conclusions	Mitigation Measures
	local network. It also enables Trustpower to support national strategic targets for the generation of renewable energy and the decarbonisation of the New Zealand economy; and › Economic and social benefits are provided through the provision of local employment, minimising costs associated with obtaining electricity from outside the Taranaki Region, and the recreational opportunities afforded by Lake Ratapiko.	
Hydrology Effects	› Trustpower proposes to continue to take / divert 5.2 m^3/s of water from the Manganui River › Trustpower are not applying to reconsent the use of the Mangaotea Stream intake (and pumps), which ceased operation in March 2018; and › Natural variability in the climate may impact the Motukawa HEPS and flows in the Manganui River in the future. Increased temperatures or dry conditions are likely to further reduce and prolong summer low flows, however, this is likely to be offset by increased flows in winter and peak flow discharges as a result of increases in mean rainfall.	› N/A
Fish Passage and Fish Screening Effects	› The fish passes on either side of the diversion weir are suitable to provide for fish species expected to migrate beyond weir. Additionally, the fish pass provided at the Ratapiko Dam service spillway has also been assessed as being suitable for providing upstream passage for migrating elvers; › Screens at the Motukawa Race intake and Motukawa Power Station intake provide some deterrent to fish passing through the screens, as does	› Retention and maintenance of the existing fish passes on the Manganui River, and at the Ratapiko Dam spillway; › Retention and maintenance of the existing screens on intake structures in the Motukawa Race, Lake Ratapiko, and at the in-race generator; and

	Key Conclusions	Mitigation Measures
	the electrical field device currently operating on the intakes. The trash screen on the in-race generator, however, provides limited deterrent to fish species travelling along the race, and as such there may be some mortality of larger fish coming into contact with the turbine; and › While some fish species that make their way to Lake Ratapiko thrive in the environment, others with downstream migratory requirements may find their way down to the tunnel intake. The trash screen and the low water velocities in front of the intake structure may deter adult eel and other larger fish species but may not prevent small fish from entering the penstocks. There will be some mortality for larger fish that make it past the trash screen at the intake.	› Enhancement of the existing trap and transfer programme to include wider parts of the Scheme that have the potential to impact on fish migration.
Aquatic Ecology Effects	› Water temperatures in the Manganui River downstream of the diversion weir are naturally high during summer (although the take / diversion may also partly contribute to higher temperatures). Fish are also able to respond to higher water temperatures by temporarily moving to cooler locations; › The water temperatures in the Manganui River account for some of the periphyton biomass in the river, along with point and non-point discharges in the river. Low, stable river flows in summer can mean that nuisance growths of periphyton are not flushed; › Water temperatures and nuisance periphyton proliferations that can occur during summer can also impact on the macroinvertebrate communities;	› Provision of a residual flow regime for the Manganui River; › Additional flow releases in summer in order to maintain the health of the Manganui River; › Monitoring programme for the additional flow releases for three years to ensure appropriateness of mitigation; › Defined operating parameters for the level of Lake Ratapiko; and › Enhancement of the existing trap and transfer programme to include wider parts of the Scheme that have

	Key Conclusions	Mitigation Measures
	For some species, the amount of habitat increases as flows increase (e.g. adult brown trout and torrentfish) and for other species it decreases (e.g. inanga feeding and redfin bully); Ecosystem services have developed in Lake Ratapiko over time and currently support a native fish community and a trout fishery; and It is not possible to avoid temporary losses of habitat for some species resulting from the fluctuating lake level and the lowering of the lake level for maintenance purposes.	the potential to impact on fish migration.
Operation of the Motukawa Race	There is the potential for gradual erosion or slumping of the Motukawa Race; andClosure of the intake structure is necessary in flood events at or above the Mean Annual Event to enable the Motukawa Race to act more as a drain to reduce the impact of local flooding.	Continued implementation of an observational approach to slumping and erosion related issues within the race, and associated identification of any remedial works required as and when necessary; Management of the intake gates during smaller flood events to manage race water levels.
Terrestrial Ecology Effects	Terrestrial ecology effects associated with the ongoing presence of structures in the Manganui River will be negligible; Lake Ratapiko has resulted in positive terrestrial ecological effects.	Provision of a residual flow regime for the Manganui River; and Defined operating parameters for the level of Lake Ratapiko.
Sedimentation Effects	Sediment behaviour in the Manganui River is similar to conditions in the river prior to the diversion weir being constructed in 1927, meaning the Motukawa HEPS has minimal	N/A

	Key Conclusions	Mitigation Measures
	sedimentation effects downstream of the diversion weir; › The largest contributor of sediment to Lake Ratapiko is the Motukawa Race. However, the Silt Pond reduces this load with an estimated sediment trapping efficiency of 90%; and › Small annual volumetric sediment change has been observed in the western arm of Lake Ratapiko; however no associated storage or operation issues are anticipated.	
Natural Character Effects	› The natural character attributes of the freshwater bodies in the vicinity of the Motukawa HEPS will remain broadly as they have in the past (with the exception of potential natural variations resulting from changing climate conditions).	› Provision of a residual flow regime for the Manganui River; › Additional flow releases in summer in order to maintain the health of the Manganui River; and › Defined operating parameters for the level of Lake Ratapiko.
Landscape and Visual Amenity Effects	› The instream structures and Motukawa Power Station are not dominant, and do not impact on the character of the surrounding landscapes; › The Motukawa Race is well established and integrated into its surroundings. Other than the removal of the Mangaotea Stream intake structure, the race will continue to operate as it currently does. Overall, the landscape and visual amenity effects of the Motukawa Race are considered to be less than minor; and › Lake Ratapiko and the Motukawa HEPS structures located in the lake are well established and integrated into their surroundings. The lake is recognised for its recreational and amenity values. Daily fluctuations of	› Provision of a residual flow regime for the Manganui River; and › Defined operating parameters for the level of Lake Ratapiko.

	Key Conclusions	Mitigation Measures
	lake levels are part of the status quo. Overall, the lake has enhanced the surrounding rural area, providing benefit to the landscape character.	
Recreation Effects	› Effects on recreation are broadly positive due to the provision of Lake Ratapiko and the water sports facilitated in the lake; › There are no indications that the Motukawa HEPS has any effects on kayaking and rafting within the Manganui River and Waitara River. Additional flow releases for the health of the river would have minimal impact on kayaking and rafting; and › Effects on fish species (that are recreationally fished) within freshwater environments within the vicinity of the Scheme are considered to be no more than minor.	› Provision of a residual flow regime for the Manganui River; › Additional flow releases in summer in order to maintain the health of the Manganui River; › Defined operating parameters for the level of Lake Ratapiko.
Dam Safety Effects	› The Ratapiko Dam will continue to be managed by Trustpower in accordance with the NZSOLD Guidelines.	› Continue to manage dam structures in accordance with the NZSOLD Guidelines and Trustpower's Dam Safety Management System.
Cultural Values Effects	› It is for the relevant iwi and hapu to describe any cultural or historical associations with the Manganui River and Waitara River, and further information on these associations is intended to be provided as part of the cultural values assessment.	› To be further considered following the conclusion of discussions with iwi and hapu.

Overall, the technical assessments conclude that the continued operation of the Motukawa HEPS can be undertaken in a manner that will appropriately sustain the key environmental values and health of the Manganui River catchment.

With respect to the National Policy Statement on Freshwater Management 2020, it is recognised that its fundamental concept is Te Mana o te Wai – which refers to the importance of water and seeks to ensure that natural and physical resources are managed in a way that (i) firstly prioritises the health and wellbeing of water bodies and freshwater ecosystems, (ii) then

the health needs of people, and (iii) then the ability of people and communities to provide for their social, economic, and cultural wellbeing. Trustpower has given particular consideration to ensuring the flow regime proposed for the Manganui River downstream of the diversion weir and intake structure is appropriate to sustain the health and wellbeing of the river, including through new consent conditions to ensure that the operation of the Motukawa HEPS changes in response to monitored changes in ecosystem health.

Overall, it is considered that the continued operation of the Motukawa HEPS is consistent with the overall management intentions specified in the relevant statutory planning documents and the sustainable management of natural and physical resources under the Resource Management Act 1991. It is however, recognised that further analysis of the mitigation requirements may be necessary once the cultural values assessments is completed by the relevant iwi and hapu representatives.

1. INTRODUCTION

1.1 BACKGROUND

This Assessment of Environmental Effects ("**AEE**") has been prepared in support of resource consent applications by Trustpower Limited ("**Trustpower**") under the Resource Management Act 1991 ("**RMA**") for the continued operation, use and maintenance of the Motukawa Hydro-Electric Power Scheme ("**Motukawa HEPS**" or "**the Scheme**").

The Motukawa HEPS is located within the Manganui River catchment to the southeast of New Plymouth. The Motukawa HEPS has been in operation (in a variety of configurations) for over 90 years and generates electricity by damming, diverting, discharging, taking and using water from the Manganui River and Lake Ratapiko (and various tributaries) via the Motukawa Power Station - which is located on Motukawa Road.

The Motukawa HEPS has an installed generation capacity of 5 MW and generates approximately 22 GWh of electricity per annum. The Scheme connects to Powerco's electricity distribution network, enabling the supply of electricity to the local community.

Land ownership of the sites on which structures and infrastructure associated with the operation of the Motukawa HEPS are located have been identified in Part A of this document, and are presented in **Appendix A** to this AEE. The respective Records of Title are provided in **Appendix B** to this AEE.

1.2 TRUSTPOWER LIMITED

1.2.1 Overview

Trustpower is New Zealand's fourth largest electricity retailer and fifth largest electricity generator. It is a listed public company and is predominantly New Zealand owned. The company grew from the Tauranga Electric Power Board, which was established in 1924. Trustpower employs approximately 800 staff, and services approximately 240,000 residential, commercial and industrial customers across New Zealand.

Trustpower's core business is the generation and retailing of electricity. Its business also incorporates the development of new electricity generation and water conveyance infrastructure, as well as the provision of telecommunication and broadband services. The Energy Companies Act 1992 requires that the principal objective of every energy company is to operate as a successful business. Consistent with this objective, Trustpower has built a reputation as a successful and responsible generator, developer and retailer of electricity. Trustpower considers that achieving strong environmental performance is an integral part of being a successful business.

Trustpower's electricity generation portfolio is predominantly derived from renewable energy sources. The company owns and operates 19 hydro-electricity generation schemes and a diesel peaking facility in New Zealand, which are geographically spread throughout the country.

Trustpower's electricity generation portfolio differs from other electricity generators in that its assets are typically of small to medium output, are relatively numerous, and are spread across a number of regions and districts. This electricity generation portfolio provides a number of benefits to Trustpower's customers, as well as to New Zealand as a whole. In this regard, several of the electricity generation schemes are embedded into the local electricity supply network and form a vital element in ensuring regional security of supply and a sustainable electricity supply within New Zealand. This commitment to local supply and proximity to demand centres is a key feature of Trustpower's generation philosophy and portfolio.

1.2.2 Trustpower's Interests in the Taranaki Region

In addition to the Motukawa HEPS, Trustpower owns and operates two other hydro-electricity generation schemes within the Taranaki Region:

- The Patea HEPS is located on the Patea River in the South Taranaki District, approximately 43 km from the coast. The Patea HEPS has an installed generation capacity of 30.7 MW and generates approximately 118 GWh of electricity per annum. The Patea HEPS consist of an 82 m high earth dam which has impounded water in the Patea River to create Lake Rotorangi. The lake is over 46 km long and provides storage within its consented 4.5 m operating range. The resource consents from the Taranaki Regional Council ("**TRC**") authorising the operation of the Patea HEPS expire in 2040; and
- The Mangorei HEPS is located in the Waiwhakaiho River catchment to the southeast of New Plymouth. The Mangorei HEPS has an installed generation capacity of 4.5 MW and generates approximately 20.9 GWh of electricity per annum. The Mangorei HEPS dams, diverts, discharges, takes and uses water from the Waiwhakaiho River and Lake Mangamahoe for power generation at the Mangorei Power Station. Resource consent applications to authorise the continued operation and maintenance of the Mangorei HEPS were made by Trustpower in November 2020.

1.3 REPORT STRUCTURE

This AEE complies with the relevant requirements in Schedule 4 of the RMA and is considered to address the relevant matters identified in the Taranaki Regional Fresh Water Plan ("**RFWP**"), Taranaki Regional Soil Plan ("**RSP**"), and the Resource Management (National Environmental Standards for Freshwater) Regulations 2020 ("**Freshwater NES**"). It comprises nine sections as follows:

Section 1: This introduction.

Section 2: Provides a description of the existing environment.

Section 3: Provides a description of the proposal.

Section 4: Sets out the resource consent requirements for the proposal.

Section 5: Provides an assessment of the actual and potential environmental effects associated with the continued operation, use and maintenance of the Motukawa HEPS.

Section 6: Outlines the consultation undertaken by Trustpower.

Section 7: Sets out the statutory framework against which the resource consent application has been made and assesses the proposal against the provisions of the relevant national and regional statutory planning documents.

Section 8: Addresses notification matters in accordance with sections 95A – 95E of the RMA.

Section 9: Provides a concluding statement.

2. EXISTING ENVIRONMENT

2.1 INTRODUCTION

This section of the AEE provides a summary of the existing physical, social, environmental and cultural values of the Motukawa HEPS in the context of the Manganui River catchment. A number of technical assessments have been commissioned by Trustpower to inform the description of the existing environment in this section of the AEE. These technical assessments are referenced, as appropriate, in the sections below and are appended to this AEE.

The description of the existing environment provides the context against which the actual and potential effects of the continued operation, use and maintenance of the Motukawa HEPS have been assessed. The existing environment is the environment as it exists at the time of determining an application for resource consent. In *Queenstown Lakes District Council v Hawthorne* [2006] CA 45/05 the Court of Appeal found that the 'environment' embraces the future state of the environment as it might be modified by the utilisation of rights to carry out permitted activities under a plan. The Court found it also includes the environment as it might be modified by the implementation of resource consents which have been granted at the time a particular resource consent application is considered, where it appears likely that those resource consents will be implemented.

Differing approaches to defining the existing environment have been adopted when considering applications for replacement resource consents. The High Court in *Ngati Rangi Trust v Manawatu-Whanganui Regional Council* [2016] NZHC 2948 concluded that it should not be assumed that existing consents with finite terms will be renewed or renewed on the same conditions. The Court adopted the position that the existing environment cannot include, in the context of renewal applications, the effects caused by the activities for which the renewal consents are sought – unless it would be fanciful or unrealistic to assess the existing environment as if those structures authorised by the consents being renewed did not exist.

The existing environment has been modified since the commissioning of the Scheme in 1927, including by the construction of the Silt Pond within the Motukawa Race prior to 1950, the construction of a new fish pass at the diversion weir on the Manganui River in 2002, and the construction of an in-race generator in 2005 / 2006. In addition, and as set out in section 4 of this AEE, a number of activities associated with the Motukawa HEPS are permitted activities and form part of the existing environment as a consequence. Defining the existing environment for the purposes of assessing the effects of the resource consent applications does not require a decision-maker to assume that the effects of the Motukawa HEPS never existed (that is, to postulate a return to a pristine and naturalised environment). Assuming that the Motukawa HEPS did not exist would be a fanciful and unrealistic exercise which does not reflect a 'real-world' approach. Having said that, the technical assessments have not discounted effects caused by the ongoing activities for which the replacement consents are

required. While legacy effects of the Motukawa HEPS have been recognised, so to have the on-going effects of the operation of the Scheme.

2.2 OVERVIEW OF THE MOTUKAWA HYDRO-ELECTRIC POWER SCHEME

The Motukawa HEPS is located east of State Highway 3 ("**SH3**") and approximately 26 km southeast of New Plymouth. The Motukawa HEPS involves the conveyance of water from the Manganui River to Lake Ratapiko via the Motukawa Race, and the eventual discharge of water to the Makara Stream (a tributary of the Waitara River).

A schematic of the Motukawa HEPS is provided in Figure 1, and an aerial overview of the Scheme is provided in Figure 2. A description of the existing consented operation of the Motukawa HEPS is provided in the sub-sections below.

2.2.1 Manganui River Diversion and Intake Structures

The existing scheme involves the damming of the Manganui River by way of a concrete diversion weir that is located across the full extent of the river (and approximately 100 m downstream of the Tariki Road bridge), and the diversion and take of up to 5.2 m^3/s of water from the river. As detailed in the Hydrology Assessment by Tonkin & Taylor (**Appendix C**), the mean annual flow of the Manganui River at the diversion weir is 6.88 m^3/s and the mean flow diverted into the Motukawa Race is 3.1 m^3/s.

In accordance with the existing consent conditions for the Motukawa HEPS, Trustpower is also required to maintain a residual flow of 400 l/s in the Manganui River downstream of the diversion weir.

Two existing fish passes are located alongside the diversion weir. The fish pass on the true right of the diversion weir is the primary source of the residual flow downstream of the diversion weir (approximately 300 l/s) and the main pathway for fish passage. The fish pass on the true left of the diversion weir provides the remaining 100 l/s of residual flow (approximate).

In addition, and in accordance with the existing consent conditions for the Motukawa HEPS, when the flow in the Waitara River (as measured at Bertrand Road) is less than or equal to 5 m^3/s, the flow in the Manganui River upstream of the diversion weir is either:

- Passed continuously through the Motukawa Race, Lake Ratapiko, and the Motukawa Power Station (with provision for the 400 l/s residual flow in the Manganui River and a 150 l/s flow in the race), and discharged into the Makara Stream; or
- Passed directly over the diversion weir / fish passes into the Manganui River (although this approach is implemented less frequently).

Furthermore, if the diversion weir has not been naturally overtopped by flows in the Manganui River of 400 l/s or more for a continuous period of 30 days, Trustpower is required to pass 400 l/s of water over the diversion weir for three hours daily to assist with matters including

the removal of periphyton build-up, the enhancement of water quality, and the initiation of fish migration.

Water diverted from the Manganui River enters the Motukawa Race via an intake structure located on the true-right bank of the river. This intake structure consists of two automatically operated vertical gates that are programmed to respond to water levels in the race. A trash screen with vertical bars spaced 150 mm apart is installed at the intake structure deflecting large debris (i.e. branches and small boulders) from entering the race. In addition, an electrical field device has been operating on these trash racks for at least 15 years to help deter fish from entering the race intake.

A set of sluice gates are located approximately 80 m along the Motukawa Race and have an associated return channel which enables the discharge of water to the Manganui River at a point approximately 675 m downstream of the diversion weir (when required).

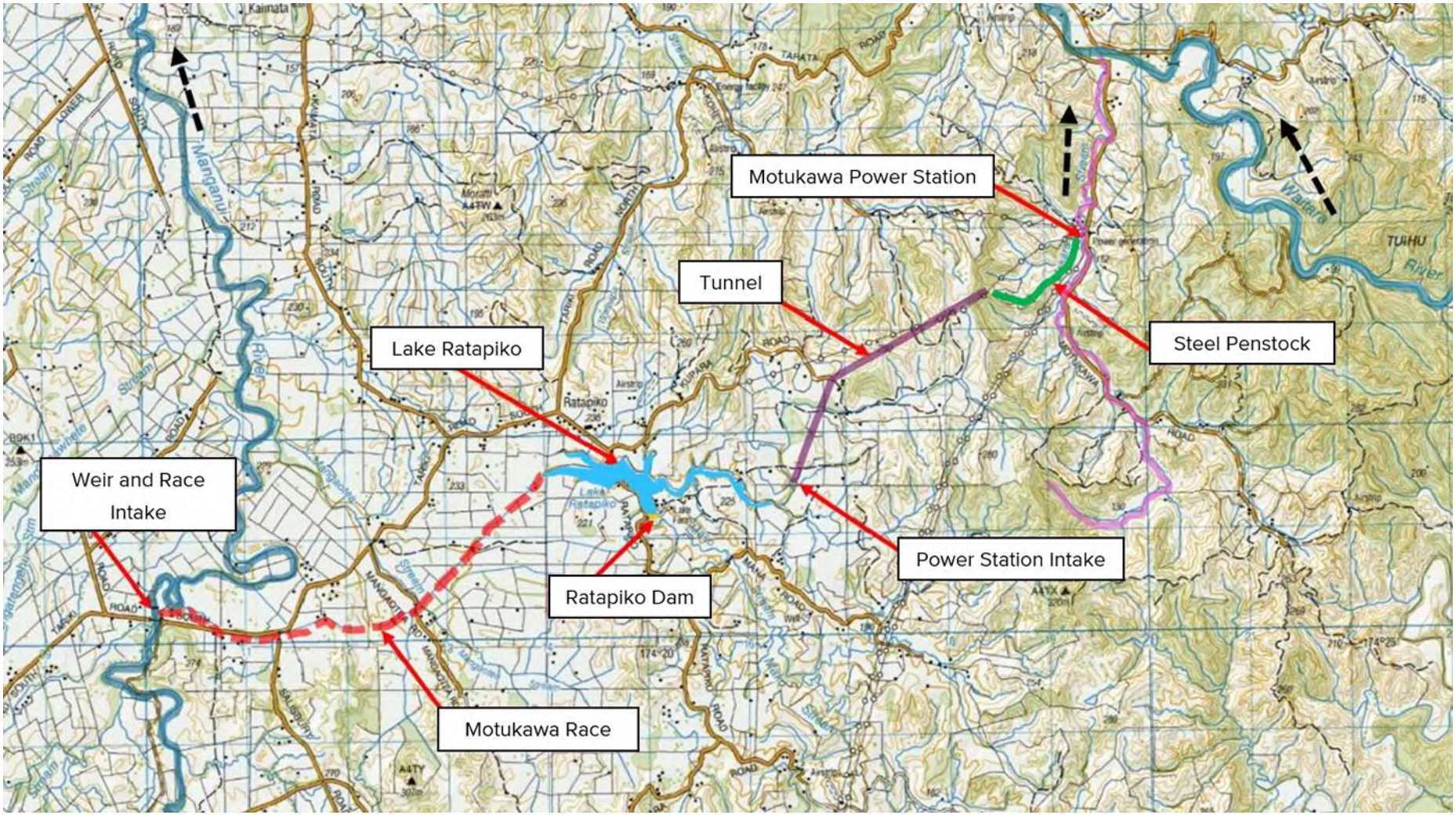


Figure 1: **Schematic of the Motukawa Hydro-Electric Power Scheme**

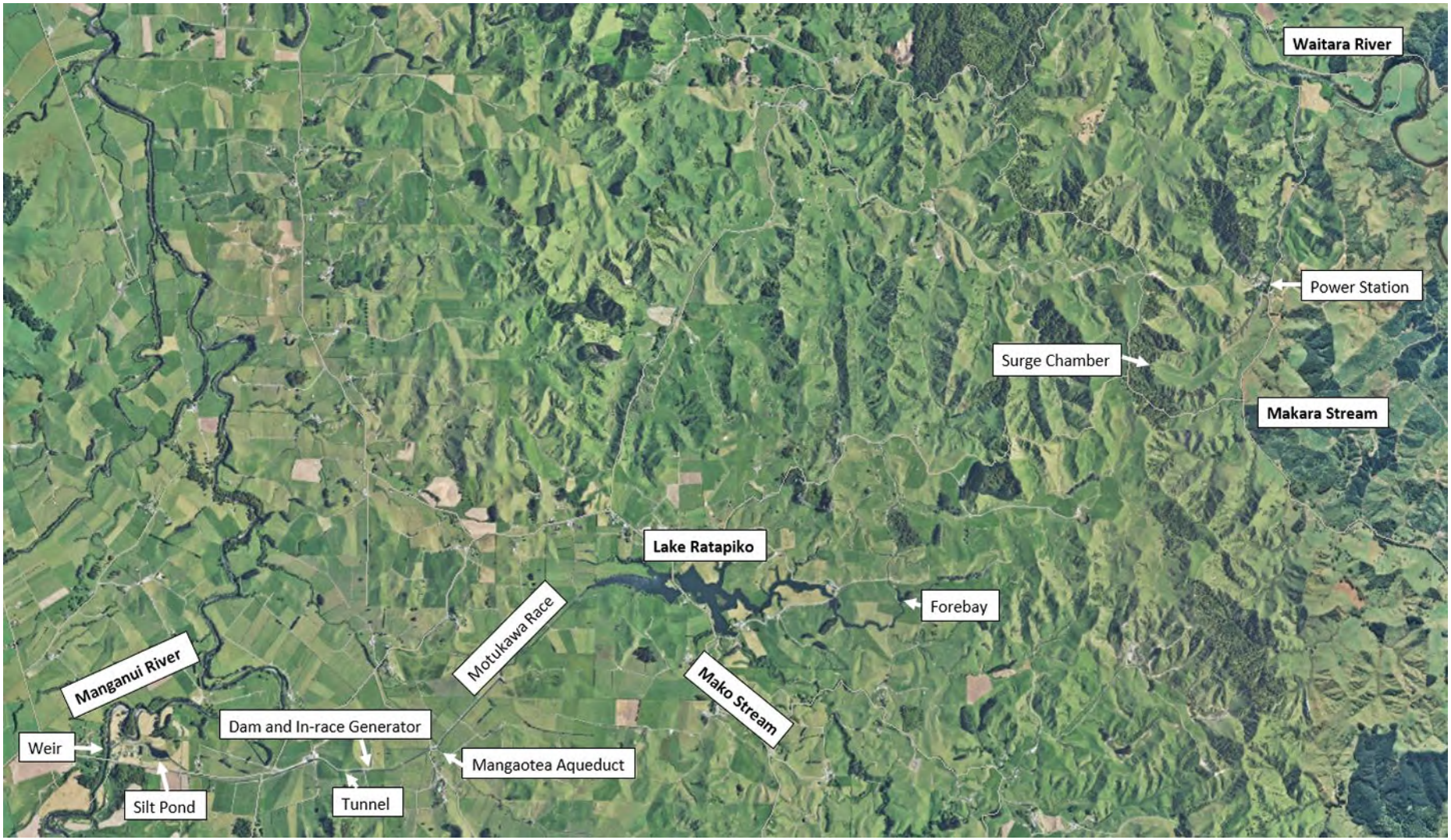


Figure 2: **Aerial Overview of the Motukawa Hydro-Electric Power Scheme**

2.2.2 Motukawa Race

The Motukawa Race is approximately 4.6 km long and conveys water diverted from the Manganui River to Lake Ratapiko. The race is typically 3 m to 8 m wide (at normal operating water levels) and is concrete-lined in some sections. It has an average gradient of 0.3%, although the gradient does vary in places.

The primary operational control on flows diverted into the Motukawa Race are the intake gates located at the entrance to the race. The intake gates control inflow to the race in order to achieve several criteria, including:

- To ensure that the required residual flow in the Manganui River, via the fish passes, is able to be maintained (subject to the hydrology of the river);
- To control the inflow to ensure compliance with the consented maximum abstraction;
- To control the inflow to ensure that unnecessary spill at Lake Ratapiko is avoided; and
- To control the inflow to limit the potential for the Scheme to contribute to localised flooding.

Water diverted from the Manganui River to the Motukawa Race passes through a Silt Pond located east of the intake structure (refer to Figure 2 above). The Silt Pond is approximately 220 m long and approximately 90 m wide at its widest point. The depth of the pond varies between approximately 1.5 to 2 m. As water passes through the Silt Pond and loses velocity, sediment drops out of the water column before it is conveyed down the Motukawa Race.

Trustpower holds Consent 10889 from the TRC to undertake maintenance dredging of the Silt Pond (which typically occurs once per year). Approximately 500 m^3 of sediment is removed from the Silt Pond each year.

Once past the Silt Pond, water travels in an eastern direction through the Motukawa Race (including through the 60 m long concrete Tunnel 1) before reaching the forebay of a small weir located in the race. A 200 KW in-race generator is located at this location, which produces approximately 0.9 GWh of electricity per year. A trash screen (with 75 mm spacing) is located within the forebay of the weir deflecting large debris from entering the generator, and a bypass valve also enables water to partially bypass the generator between 1 November and 28 February (when the valve is opened and operation of the generator also continues).

The approximate location of the weir and in-race generator is also illustrated in Figure 2 above.

Water then continues along the Motukawa Race before being conveyed over the Mangaotea Stream via an aqueduct (Mangaotea Aqueduct) and eventually entering Lake Ratapiko.

Trustpower utilise a race water level control system to monitor the level of water in the Motukawa Race in order to minimise the potential for flooding of adjacent farmland. This is achieved by way of measuring the water level (at a minimum of 15 minute intervals) and ensuring the consented maximum race water levels detailed in Table 2 below are maintained at four locations along the race.

Table 2: Maximum Consented Race Water Levels

Location	Existing Maximum Consented Level (m RL)
Salisbury Road Bridge	205.20
Mangaotea Road Culvert	199.30
Mangaotea Aqueduct	199.25
Lower Mangaotea	199.15

Periodic maintenance is undertaken in the Motukawa Race during which times Trustpower maintain a flow of 150 l/s in the race in order to provide sufficient flow for fish species. However, in the event that it is not practicable to maintain this flow, Trustpower undertake fish salvage operations to enable the relocation of stranded fish in the race.

Maintenance activities include a five-yearly monitoring survey of the Motukawa Race to identify any maintenance requirements that are necessary in order to maintain race capacity.

2.2.2.1 Mangaotea Aqueduct

Approximately halfway between the Manganui River and Lake Ratapiko, the Motukawa Race crosses the Mangaotea Stream. As noted above, the water in the race crosses the stream by way of the Mangaotea Aqueduct.

The location of the Mangaotea Aqueduct is illustrated in Figure 2 above.

Trustpower is authorised to discharge up to 2 m^3/s of water from the Mangaotea Aqueduct into the Mangaotea Stream during emergency conditions (i.e. when local stormwater runoff to the Motukawa Race is required to be discharged in order to avoid flooding of adjoining land). This discharge occurs by way of an existing gate in the lowered northern side of the aqueduct and is controlled by the race water level control system.

The discharge of water from the Mangaotea Aqueduct to the Mangaotea Stream has only occurred three times in the last 20 years.

2.2.2.2 Mangaotea Stream Intake Structure

A water intake structure and pumps are located in the bed of the Mangaotea Stream and enable the take and use of up to 450 l/s of water for hydro-electricity generation purposes from the stream for use in the Motukawa Race. That is, the intake and pumps enable flows in the Mangaotea Stream to be utilised to supplement the flow being conveyed to Lake Ratapiko for hydro-electricity generation.

Trustpower have not operated the intake structure and pumps since March 2018.

2.2.3 Lake Ratapiko

Lake Ratapiko is a man-made lake which provides water storage for hydro-electricity generation at the Motukawa Power Station. The lake also provides a recreational resource, primarily for water-skiing, jet-boating and fishing.

Lake Ratapiko is formed by a 12 m high earth dam located across the Mako Stream (Ratapiko Dam).

The Ratapiko Dam is operated subject to the surveillance and monitoring requirements of the New Zealand Society of Large Dams ("**NZSOLD**") Guidelines. The dam includes a service spillway and an auxiliary spillway, both of which allow for the discharge of water from Lake Ratapiko to the Mako Stream. No residual flow is required in the Mako Stream as part of the existing resource consents.

The discharge of water via the service spillway is not controlled by a gate structure. Rather, water is able to overtop 300 mm high tipping flashboards mounted on the top of the spillway crest when the level of Lake Ratapiko exceeds 198.7 m RL. Trustpower is currently authorised to discharge up to 55 m^3/s via the service spillway during 'adverse weather conditions'.

The 14 m wide auxiliary spillway is equipped with a fuse plug that activates (i.e. washes out) to provide more flood capacity when the level of Lake Ratapiko exceeds 199.22 m RL. The auxiliary spillway has operated on three occasions since its construction in 1994.

Spill flows over the Ratapiko Dam occur approximately 0.3% of the time.

A fish pass facility, in the form of a small pipe with a small water supply from a hose, is provided at the base of the service spillway, providing upstream passage for elvers from the Mako Stream into Lake Ratapiko.

Lake Ratapiko has an operating range of 4.7 m below the crest of the service spillway (198.7 m RL). The lake level is managed so that it does not fall below 194 m RL (except during maintenance for the purpose of controlling aquatic weed growth). At those times when Lake Ratapiko is drawn down for maintenance, the lowering occurs over a seven

day period in order to minimise the potential for fish stranding. The level of Lake Ratapiko is typically maintained between 194.5 m RL and 198.7 m RL.

Inflows to Lake Ratapiko consist of runoff from the local catchment (i.e. the Mako Stream) and flows conveyed by the Motukawa Race. In this regard, Trustpower is authorised to divert up to 8,000 l/s of stormwater runoff and the entire flow of small tributaries that drain into the race and lake. The diversion of water from the Motukawa Race contributes approximately 88% of the inflows into Lake Ratapiko.

Trustpower is also authorised to undertake maintenance dredging of Lake Ratapiko and to discharge / deposit up to 4,000 m^3/day of dredged material (10,000 m^3/year) onto land above the one-metre mark around the lake margin. Additionally, Trustpower undertake various maintenance and repair activities to the structures within Lake Ratapiko.

2.2.4 Motukawa Power Station

Up to 7.87 m^3/s of water is diverted from Lake Ratapiko via an intake structure located in the forebay at the eastern end of the lake. Water is then conveyed through a 2.8 km long tunnel and 1.6 km long steel penstock to the Motukawa Power Station – which is located on Motukawa Road. The mean diversion of water from Lake Ratapiko to the Motukawa Power Station is approximately 3.56 m^3/s.

A barrier screen with spacings of 37 mm – 40 mm is installed on the intake structure blocking debris from entering the intake tunnel and assisting with avoiding the entrainment of larger eels and fish into the tunnel. An electrical field device to deter fish away from the entrance to the penstocks is installed in the forebay of the penstocks and has been in place for at least 15 years.

2.2.5 Makara Stream and the Waitara River

Trustpower is authorised to discharge up to 7.87 m^3/s of water from the Motukawa Power Station into the Makara Stream, which subsequently discharges into the Waitara River approximately 1.7 km downstream from the power station. The mean discharge of water from the Motukawa Power Station to the stream matches the mean diversion of water from Lake Ratapiko, being approximately 3.56 m^3/s.

There are diurnal variations in the outflow from the Motukawa Power Station in response to changes in electricity generation demand. These diurnal flow patterns are evident in the hydrological patterns in the Makara Stream and in the Waitara River (Bertrand Road and beyond), with attenuation of the flow variation occurring as the water moves downstream.

During maintenance activities, Trustpower discharges up to 2 m^3/s of water from the surge chamber (located between the tunnel and penstocks) into an unnamed tributary of the Makara Stream.

2.3 EXISTING RESOURCE CONSENTS

The existing resource consents held by Trustpower for the operation, use and maintenance of the Motukawa HEPS are summarised in Table 3 below. Copies of the existing resource consents held by Trustpower are provided as **Appendix D** to this AEE.

Table 3: Summary of Existing Resource Consents for the Motukawa HEPS

Consent Number	Consent Type	Activity	Summary of Key Conditions
1166	Discharge Permit	To discharge up to 4,000 m^3/day [10,000 m^3/year] of dredged material from maintenance of Lake Ratapiko onto land above the 1 m mark around the lake margin.	1. The discharge shall occur according to best practicable option to avoid or minimise the discharge of silt or other contaminants onto land.
3369	Water Permit	To take and use up to 5,200 l/s of water from the Manganui River for hydro-electric power generation purposes.	1. Maintain a residual flow of not less than 400 l/s at all times in the Manganui River below the weir; 2. The take shall be managed so to ensure that when the flow in the Waitara River, as measured at Bertrand Road, is less than or equal to 5,000 l/s, the flow in the upper Manganui River, above the weir will either: (a) Pass directly over the weir into the Manganui River; or (b) Pass continuously through Lake Ratapiko [with provision for the residual flow in the Manganui River] and the power station into the Makara Stream, and thence the lower Waitara River; 3. 400 l/s shall pass over the weir for three hours daily if the weir is not naturally overtopped by flows in the Manganui River, of the same or larger volume, for a continuous period of 30 days; 4. A flow of 150 l/s shall be maintained in the race as far as is practicable during maintenance periods. During periods

Consent Number	Consent Type	Activity	Summary of Key Conditions
			when it is not practicable, Trustpower shall arrange for a fish salvage operation to relocate stranded fish from the race.
3371-2	Water Permit	To divert and use up to 8,000 l/s of stormwater run-off and the entire flow of various unnamed watercourses draining into the race and into Lake Ratapiko for hydro-electric power generation purposes.	1. Manage the water in the race to avoid or minimise the potential for flooding of adjacent farmland by ensuring a maximum race water level (metres), above mean sea-level, of: › 205.20 at Salisbury Road; › 199.30 at Mangaotea; › 199.25 at the Mangaotea Aqueduct; and › 199.15 at Lower Mangaotea. 2. Complete a five-yearly monitoring survey of the race to identify any maintenance requirements in order to maintain a race capacity of 8,000 l/s for the purpose of avoiding flooding adjacent farmland.
3372	Discharge Permit	To discharge up to 7,787 l/s of water from the Motukawa Power Station into the Makara Stream.	1. The take shall be managed so to ensure that when the flow in the Waitara River, as measured at the Bertrand Road hydrology gauging site, is less than or equal to 5,000 l/s, the flow in the upper Manganui River, above the weir will either: (a) Pass directly over the weir into the Manganui River; or (b) Pass continuously through Lake Ratapiko [with provision for the residual flow in the Manganui River] and the power station into the Makara Stream, and thence the lower Waitara River; 2. Design, install, maintain and monitor a facility to enable the passage of elvers over the dam.
3373	Land Use Consent	To dam the Mako Stream to form Lake Ratapiko for hydro-	1. Maintain and operate a safe dam.

Consent Number	Consent Type	Activity	Summary of Key Conditions
		electric power generation purposes, including the spillway structure.	2. Construct, place and maintain a structure on top of the spillway crest for the purpose of increasing lake storage. 3. Manage the structure and the lake level so to avoid flooding of land adjacent to the lake and race. 4. Ensure that a minimum lake water level of 194 m above mean sea level, is retained at all times, except during periods of maintenance, for the purpose of maintaining aquatic habitat. 5. Ensure the maximum level, under normal operating conditions, of Lake Ratapiko does not exceed 198.7 m above mean sea level. 6. Design, install, maintain and monitor a facility to enable the passage of elvers and adult eels over the spillway.
5080	Land Use Consent	To erect, place, use and maintain the weir and various structures associated with hydro-electric power generation activities in the Manganui River.	1. Design, install, maintain and monitor a structure at the weir to enable the passage of eels, native fish, juvenile and adult trout. 2. Install, maintain and operate a light barrier for the purpose of diverting fish from the intake gate.
5081	Land Use Consent	To erect, place, use and maintain the Mangaotea Aqueduct associated with hydro-electric power generation activities in and above the Mangaotea Stream.	N/A
5082	Discharge Permit	To discharge, under emergency conditions, up to 2,000 l/s of overflow water from the Mangaotea	1. Emergency conditions constitute a period when local stormwater runoff to the race is required to be discharged to the Mangaotea Stream in order to avoid the race flooding adjacent land.

Consent Number	Consent Type	Activity	Summary of Key Conditions
		Aqueduct into the Mangaotea Stream.	2. The discharge shall be managed so to avoid or minimise the flooding of farmland and roads below the discharge. 3. The consent holder shall set aside $600 Annually [adjusted annually to reflect changes in the Cost Construction Index], for the maintenance of the flood capacity of the Mangaotea Stream below the discharge.
5084	Discharge Permit	To discharge up to 55,000 l/s of hydro-electric power generation water, during adverse weather conditions, via spillways and lake drainage valves from Lake Ratapiko into the Mako Stream.	1. Prepare a contingency plan for the purpose of managing the discharge so to avoid or minimise damage to property downstream. 2. The consent shall be exercised in accordance with the contingency plan.
5085	Land Use Consent	To disturb the bed of Lake Ratapiko for maintenance and repairs associated with hydro-electric power generation purposes.	1. Notify the TRC at least 48 hours prior to the commencement of any disturbance. 2. Adopt the best practicable option to prevent or minimise any actual or potential effect on the environment.
5086	Land Use Consent	To erect, place, use and maintain various structures in, on and over the bed of Lake Ratapiko for hydro-electric power generation purposes.	1. Maintain the penstock intake screens with spaces no larger than 30 mm in order to minimise eel and fish entrapment. 2. Install, maintain and operate a light barrier for the purpose of diverting fish from the penstock intake screens. 3. Upgrade the Ratapiko Road causeway so as not to restrict the flow of water between the two parts of Lake Ratapiko, for the purpose of avoiding flooding land adjoining the race.

Consent Number	Consent Type	Activity	Summary of Key Conditions
5087	Water Permit	To take and use up to 7,787 l/s of water from Lake Ratapiko for hydro-electric power generation purposes.	1. Ensure that a minimum lake water level of 194 m above mean sea level is retained at all times, except during periods of maintenance, for the purpose of maintaining aquatic habitat. 2. Draw the level of Lake Ratapiko down gradually for lake maintenance purposes, over a 7-day period, in order to avoid or minimise fish stranding, and notify the TRC and Fish and Game New Zealand at the commencement of the draw down period. 3. Ensure that the maximum level, under normal operating conditions, of Lake Ratapiko does not exceed 198.7 m above mean sea level. 4. Manage lake levels so as to avoid or minimise the potential for the flooding of land adjoining the lake and race.
5088	Discharge Permit	To discharge up to 2,000 l/s of water from the surge chamber of the Motukawa Power Station during maintenance periods into an unnamed tributary of the Makara Stream.	1. Prepare a contingency plan for the purpose of managing the discharge so to avoid or minimise the potential for damage to property downstream. 2. The consent shall be exercised in accordance with the contingency plan. 3. The TRC shall be notified at least 48 hours prior to the discharge, and the best practicable option shall be adopted to prevent or minimise any actual or likely effect on the environment arising from the discharge.
6381	Water Permit	To take and use water from the Mangaotea Stream for hydro-electric power generation purposes.	1. The volume of water abstracted shall not exceed 38,800 m^3/day at a rate not exceeding 450 l/s. 2. If a flushing flow (defined as three times the median flow) has not occurred with a continuous period of 20 days, abstraction shall be ceased for 8 hours during the next naturally occurring flushing flow, so as to

Consent Number	Consent Type	Activity	Summary of Key Conditions
			enhance water quality downstream of the abstraction point.
6382	Water Permit	To impound water behind a temporary dam within the Mangaotea Stream for the purposes of constructing a water intake structure for hydro-electric power generation purposes.	N/A
6383	Water Permit	To divert water around a temporary dam within the Mangaotea Stream for the purposes of constructing a water intake structure for hydro-electric power generation purposes.	N/A
6384	Land Use Consent	To erect, place and maintain a temporary dam within the Mangaotea Stream for the purposes of constructing a water intake structure for hydro-electric power generation purposes.	N/A
6385	Land Use Consent	To erect, place and maintain an intake structure including pumps in the bed of the Mangaotea Stream for the purposes of abstracting water for	1. Best practicable option shall be adopted at all times to prevent or minimise any adverse effects on the environment. 2. The intake structure shall not obstruct fish passage. 3. The intake shall be appropriately screened to avoid the entrapment of freshwater fauna.

Consent Number	Consent Type	Activity	Summary of Key Conditions
		hydro-electric power generation purposes.	4. The structure[s] authorised by this consent shall be removed and the area reinstated, if and when the structure[s] are no longer required.
6386	Land Use Consent	To disturb and modify the bed and banks of the Mangaotea Stream, associated with the construction of an intake structure for hydro-electric power generation purposes.	N/A
6387	Discharge Permit	To discharge sediments from earthworks into the Mangaotea Stream, associated with the construction of an intake structure, for hydro-electric power generation purposes.	N/A
6388-1	Water Permit	To divert and use water in the Motukawa Race for hydro-electric power generation purposes.	1. Best practicable option shall be adopted at all times to prevent or minimise any adverse effects on the environment.
6388-1	Water Permit	To divert and use water in the Motukawa Race for hydro-electric power generation purposes.	1. Best practicable option shall be adopted at all times to prevent or minimise any adverse effects on the environment.
6390	Water Permit	To impound water behind a dam on the Motukawa Race for	1. Best practicable option shall be adopted at all times to prevent or minimise any adverse effects on the environment.

Consent Number	Consent Type	Activity	Summary of Key Conditions
		hydro-electric power generation purposes.	2. The intake shall be appropriately screened to avoid entrapment of freshwater fauna. 3. On three occasions during November to February each year, generation from the turbine unit will be ceased and the bypass valve will be opened for 12 hours in order to enable trout to pass through the dam. 4. Manage the water in the race to avoid or minimise the potential for flooding of adjacent farmland.
6391	Discharge Permit	To discharge sediment during earthworks associated with the construction of a generator structure into the Motukawa Race.	N/A
10899	Land Use Consent	To dredge the bed of a settling pond in the Motukawa Race	1. The area and volume of pond bed and bank disturbance shall, so far as is practicable, be minimised and any areas which are disturbed shall, so far as is practicable, be reinstated. 2. No stockpiles, sludge or vegetation shall be left in a position where it may enter a waterbody. 3. No dredging activities shall take place between 1 May and 31 October inclusive. 4. A silt curtain shall be installed at the outlet of the pond to prevent sediment entering the race. 5. Prepare and implement a fish recovery plan.
10890 & 10891	Water Permit	To dam water and take water for maintenance works in the Motukawa Race.	1. Maintain a flow of no less than 150 l/s downstream of the works. 2. Prepare and implement a fish recovery plan.

Consent Number	Consent Type	Activity	Summary of Key Conditions
			3. Ensure that the intake is screened to avoid fish entering the intake or being trapped against the screen.

Based upon the annual monitoring reports for the Motukawa HEPS prepared by the TRC,[1] it is considered that Trustpower have maintained a high level of environmental and compliance performance in relation to the operation of the Scheme against the consent conditions noted in Table 3 above.

The existing resource consents for the Motukawa HEPS expire on 1 June 2022.

2.4 GENERAL SURROUNDING CONDITIONS

The Motukawa HEPS is located within the Manganui River catchment, which collects water from an approximately 1,146 km^2 catchment that has two points of origin, being the eastern hill country and Mount Taranaki.

The climate is generally mild, with relatively high humidity and variable rainfall varying across the catchment. In this regard, rainfall within the eastern hill country is up to 8,000 mm per annum, and in the middle and western parts of the catchment ranges between 1,800 mm and 2,200 mm per annum. Slopes and topography within the broader landscape range from gently undulating to steep and finely dissected.

The vegetation pattern in the catchment is predominantly developed pasture, with numerous patches of introduced and indigenous scrub / forest. Related to this, pastoral farming and agriculture are the predominant land uses within the immediate catchment.

Other notable land uses in the catchment include quarries located at the end of York Road (adjacent to the Manganui River), Everett Park Scenic Reserve, dairy farming activities surrounding Lake Ratapiko, and a number of minor structures related to recreational activities (e.g. walking track crossings).

2.5 MANGANUI RIVER

The Manganui River is a narrow, single channel river that is typically 10 m to 30 m wide in the reaches downstream of the diversion weir. The banks of the Manganui River are frequently very steep and densely vegetated, with the surrounding landscape being

[1] *TRC – Motukawa HEP Scheme Monitoring Programme Annual Report 2019 – 2020; Technical Report 2020-15.*

dominated by agricultural land use, with a mixture of indigenous and introduced vegetation, rough pasture and introduced shrubs and trees.

The diversion weir was built in the 1920s and is located approximately 100 m downstream of the Tariki Road bridge. From the diversion weir, the Manganui River flows for 24 km before joining the Waitara River. The Waitara River enters the Tasman Sea a further 18 km downstream of this confluence.

2.5.1 Natural Character and Landscape Values of the Manganui River

The natural character and landscape values of the Manganui River are assessed in detail within the Natural Character, Landscape and Visual Assessment prepared by Boffa Miskell, provided as **Appendix E** to this AEE. The assessment assesses the existing natural character and landscape values of the Manganui River along various reaches. This assessment is summarised below:

- The reach of the Manganui River located within Egmont National Park has a 'very high' level of natural character. This reflects the river's natural and dynamic system, which possesses natural flows and unmodified indigenous vegetation within its margins, and its location amongst a largely unmodified landscape. The aquatic communities present are indicative of excellent stream health and include the presence of native fish species;
- The reach of the river between Egmont National Park and Tariki Road South has a 'high' level of natural character. This reach originates in Egmont National Park, but then traverses through modified landscapes that are consistent with the agricultural land use dominating the surrounding landscape. This reach of the river is generally meandering and incised, and enclosed by a mix of indigenous and exotic plant species (including the presence of two significant natural areas). The aquatic communities present are indicative of excellent stream health and include the presence of native fish species; and
- The reach of the river that extends from upstream of the diversion weir to the confluence with the Waitara River has a 'moderate' natural character value. It contains the diversion weir, intake structure and fish passage structures, and a modified flow regime. Its banks are generally steep and densely vegetated with both exotic and native species. The reach contains mainly clear and fast running water and receives water from a number of tributaries. The surrounding landscape is predominantly rural pastureland, however, there are two protected forests along its length.

The Upper Manganui River is identified as an Outstanding Freshwater Body[2] (upstream of the diversion weir), and a high value waterbody[3] (down to the confluence with the Waitara River) in the relevant statutory planning documents administered by the TRC. Specific values of the river include its regionally important water quality, recreational fishery and aesthetic values.

2.5.2 Geology of the Manganui River

The geology of the Manganui River at the headwaters and on the ring plain of Mount Taranaki are dominated by volcanic deposits, and consist of:

- Holocene lahar flows and Late Pleistocene debris avalanche deposits dominated by multiple beds of unconsolidated deposits, mostly gravel and sands;
- Lavas of the Egmont Volcanic Centre near the headwaters; and
- Cobbles and boulders.

The geology of the Manganui River after leaving the slopes of Mount Taranaki is a meandering gravel river with riffles, mid-channel islands, point bars and lateral bars. The banks of the Manganui River, both upstream and downstream of the diversion weir, are steep and comprise boulders held in a clay matrix. Unsorted cobbles are also present downstream of the diversion weir across the channel floor, with in-channel geomorphic units that include riffles and point bars.

Soils within the Manganui River are identified as allophanic soils, which mostly comprise fines and have a low erosion rate, unless exposed or on steep slopes where they are likely to erode as sands, silts and clay. Recent and raw soils in the Manganui River sub-catchment up to the diversion weir are made up of boulders to clay size particles and are best described as volcanic deposits.

2.5.3 Hydrology of the Manganui River

As detailed in the Hydrology Assessment by Tonkin & Taylor, the flow at the diversion weir is not currently monitored. As such, a synthetic record for the diversion weir was developed – as well as considering the flow records at the monitoring sites at SH3 and Everett Park (which is approximately 16 km downstream of the diversion weir).

The mean annual flow of the Manganui River is:

- 1.56 m^3/s at SH3 (over a 48-year period);

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[2] *Freshwater Bodies of Outstanding or Significant Value in the Taranaki Region – Review of the Regional Fresh Water Plan for Taranaki.* Document 1602585 January 2016.

[3] *Taranaki Regional Policy Statement Appendix 1*: River and stream catchments of high quality or value for their natural, ecological and amenity values.

- 6.88 m^3/s at the diversion weir (between 2009 and 2020); and
- 18.86 m^3/s at Everett Park (over a 29-year period).

Monthly mean flows at each of the gauge locations within the Manganui River are provided in Figure 3 below.

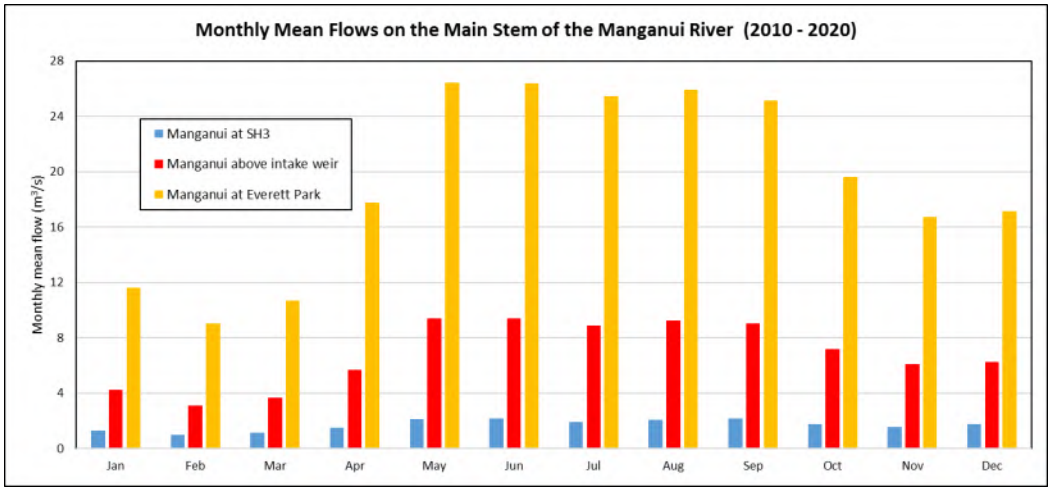

Figure 3: Monthly Mean Flows of the Manganui River

Figure 4 below presents mean flow duration plots for the Manganui River at the three locations for their overlapping record period (i.e. October 2009 to December 2020). The median flow is 4.17 m^3/s at SH3 and 10.35 m^3/s at Everett Park.

A flow of 5.6 m^3/s at the diversion weir (being the consented maximum take (5.2 m^3/s) plus the minimum residual flow below the diversion weir (400 l/s)), is exceeded 32% of the time.

Tonkin & Taylor advise that the Manganui River experiences the highest average flows in June to August, with December to February being the driest season.

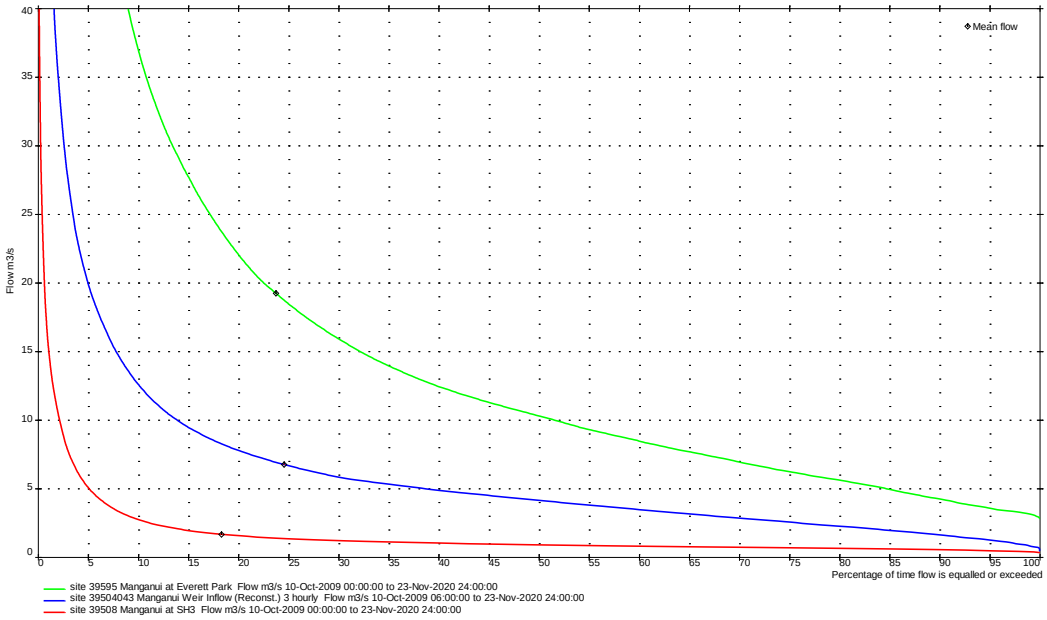

Figure 4: Manganui River Mean Flow Duration Curve (October 2009 to December 2020)

Large floods within the Manganui River can occur at any time of the year, with the period from January to March recording the fewest (10% at the SH3). Data indicates a decrease in flood intensity from the upper catchment of the Manganui River (SH3) to the middle part of the catchment (i.e. the diversion weir). The flood intensity does not appear to reduce downstream of the diversion weir. The mean annual flood at SH3, the diversion weir and Everett Park are 60 m^3/s, 201 m^3/s and 713 m^3/s respectively.

2.5.4 Aquatic Ecology of the Manganui River

The following sections have been informed by the Aquatic Ecology Assessment, prepared by Ryder Environmental Limited (provided as **Appendix F** to this AEE).

2.5.4.1 Water Quality

Nutrients, Clarity and Bacteria

Ten year trend analysis indicates that dissolved reactive phosphorus, total and ammoniacal nitrogen concentrations and faecal bacteria concentrations are all increasing in the Manganui River upstream of the diversion weir. Nutrient and faecal bacteria concentrations in the Manganui River reflect the agricultural nature of the catchment, with associated non-point source run-off and point source discharges.

Phosphorus levels in the river are influenced by its source on the slopes of Mount Taranaki, which is a naturally high source of phosphorus for rivers in the Taranaki Region.

Ryder Environmental notes that ammoniacal nitrogen concentrations fall within Band A of the National Objectives Framework ("**NOF**") set out in the National Policy Statement for Freshwater Management 2020 ("**NPSFM**"), indicating current concentrations would have no observed effect on any species. Dissolved reactive phosphorus concentrations are within NOF Band B, indicating ecological communities may be slightly impacted by current concentrations. Faecal bacteria concentrations are within NOF Band D, indicating increasing degradation.

In order to compare water quality at the SH3 site to that downstream of the diversion weir, additional monthly water quality monitoring was undertaken by Ryder Environmental in the Manganui River at a site located approximately 2.3 km downstream of the diversion weir from 2019 to 2021. This monitoring indicated median values of most water quality parameters were similar between the two sites, with the exception of nitrogen and faecal bacteria - which were predominantly higher at the downstream site. This was likely due to increased land use intensity downstream.

Water Temperature

Water temperature is monitored at three sites in the Manganui River by the TRC, including immediately upstream of the diversion weir, and at a site located 2.3 km downstream of the diversion weir.

Water temperatures within the Manganui River follow a seasonal pattern, with a gradual increase in temperatures from August to February before temperatures begin to reduce again. Maximum water temperatures are typically higher immediately downstream of the diversion weir compared to measurements recorded at the downstream site.

Water temperatures were particularly high over the 2018 – 2019 summer period, with maximum temperatures greater than 25 °C recorded on 14 separate occasions. Maximum daily temperatures tend to range higher downstream of the diversion weir than upstream.

The range of thermal preference for most native fish species is greater than 25 °C, however, brown trout have lower temperature tolerances than native fish (24.6 °C) and as such are the main fish species of concern in the Manganui River. In the case of brown trout, the acute thermal criteria were exceeded 0.5% of the time at the upstream site, and 4.5% of the time at the downstream site. The brown trout chronic thermal criteria were exceeded 8.3% of the time at the upstream site, and 20.0% of the time at the downstream site.

It is typical for temperatures to naturally increase downstream in all rivers, and this is also the case with the Manganui River.

2.5.4.2 Periphyton

The TRC monitors the periphyton community at two sites in the Manganui River, being:

- SH3; and
- Bristol Road (approximately 15 km downstream of the diversion weir).

The New Zealand Periphyton Guidelines for Recreation are exceeded when filamentous algae cover at least 30% of the bed and / or thick mats of algae cover at least 60% of the bed. Thick mat coverage has never exceeded the guidelines within the Manganui River at the two monitoring sites. However, long filamentous algae cover has exceeded the guidelines on approximately 15% of monitoring occasions at the Bristol Road site. Despite these exceedances, trend analysis has found no change in the percentage cover of thick mats or the cover of long filaments at this site.

Periphyton biomass within the Manganui River at the SH3 site has never exceeded the guideline for benthic biodiversity (50 mg/m^2). The Bristol Road site, however, has exceeded this guideline twice. Monitoring to date has indicated that chlorophyll *a* concentrations have never exceeded 200 mg/m^2 at the SH3 site.

Overall, the long-term monitoring of periphyton cover and biomass in the Manganui River indicates that long filamentous nuisance algae proliferations occur at times at the Bristol Road site, but not at the SH3 site.

2.5.4.3 Macroinvertebrates

The TRC monitors the benthic macroinvertebrate community at six sites in the Manganui River, including upstream and downstream of the diversion weir.

Monitoring of benthic macroinvertebrate community health has indicated that community health reduces in the downstream reaches of the Manganui River. These results are to be expected due to the river's transition from the Egmont National Park to predominantly agricultural land uses in the downstream environment. This is evident in the ten-year trend analysis of macroinvertebrate community scores, which deteriorate from scores indicative of an 'excellent' habitat at the SH3 site, to scores indicative of a 'poor' habitat at the Bristol Road site (with an environment that is considered to be 'very likely degrading').

2.5.4.4 Fish

The New Zealand Freshwater Fish Database ("**NZFFD**") indicates there are 20 fish species within the Manganui River catchment. A combination of recent fish surveys, and information from the NZFFD indicates at least eight species of fish have been recorded upstream of the diversion weir, including longfin and shortfin eels, common / Cran's and redfin bullies, inanga, koaro, shortjaw kokopu, and brown trout.

While lamprey have never been recorded upstream of the diversion weir, two individuals have been recorded within the Silt Pond (juveniles). Pheromone sampling by NIWA for the presence of lamprey in the Motukawa Race and tributaries of Lake Ratapiko in 2021 did not, however, detect the presence of lamprey within the infrastructure of the Motukawa

HEPS. It is, however, considered likely that lamprey are present in the upstream catchment of the Manganui River.

A number of the species identified in the Manganui River are classified as 'threatened – nationally vulnerable' (including shortjaw kokopu and lamprey).

2.5.5 Fish Passage and Fish Screening in the Manganui River

There are a number of features of the Motukawa HEPS that are relevant to fish passage. Each of these features are described further in the sub-sections below.

Diversion Weir

The intake to the Motukawa Race on the Manganui River comprises an approximately 4 m high concrete diversion weir across the full width of the river, with fish passes located adjacent to the weir on the left and right banks of the river (as shown in Figure 5 below).

Figure 5: Motukawa Race Intake Components

Ryder Environmental have identified that the fish passes appear to be effective at providing upstream fish passage for all species, with longfin and shortfin eels, common / Cran's and redfin bullies, inanga, koaro, shortjaw kokopu, and brown trout, all being recorded upstream of the diversion weir.

The true right bank fish pass was constructed in 2002 and was designed to provide a more 'natural' stream-like environment with a series of riffles and pools. The fish pass on the true left bank is older and provides an alternative fish passage pathway. The two fish passes provide fish passage all year round.

Residual Reach

As previously noted, Trustpower is required to maintain a minimum residual flow of 400 l/s in the Manganui River below the diversion weir at all times. The mean residual flow for the water period between 2009 and 2020 was 513 l/s. The residual flow in the river is augmented by contributions from several tributaries that enter downstream of the diversion weir.

In addition to the above, flow variability in the Manganui River is maintained by natural floods and freshes which are frequent in the river. Such flow variability is important for migratory fish to move upstream or downstream, depending on life cycle stage. Information on fish distribution in the Manganui River catchment indicates all migratory fish species present in the catchment are found at least as far upstream as the diversion weir, indicating that passage is being provided through the residual reach.

Motukawa Race Intake / Entrance

The intake to the Motukawa Race is located on the true right bank of the Manganui River, immediately upstream of the true right bank fish pass. Due to the proximity of the intake to this fish pass, there is a risk that migrating fish can become entrained in the race. There are also trash screens, consisting of 150 mm wide vertical bars, located several metres down from the intake.

Ryder Environmental considers that there is a low risk of larger fish being entrained in this trash screen.

2.6 MOTUKAWA RACE

The Motukawa Race extends from the Manganui River to Lake Ratapiko. The race is linear infrastructure located within a relatively flat landscape, similar to many of the surrounding roads and farm races. The Motukawa Race it is not easily visible from surrounding areas, apart from when viewed from bridges / culverts that cross the race.

The Motukawa Race contains a number of elements across its length, including:

- The Silt Pond - located approximately 275 m from the intake structure;
- A small weir and gauge at Tariki Road ("**Tariki Weir**") - located approximately 200 m from the Silt Pond;
- An in-race generator - located approximately 1.7 km from the Silt Pond;
- The Mangaotea Aqueduct - located approximately 570 m along from the in-race generator; and
- Numerous road and farm crossings providing access to properties and paddocks.

2.6.1 Natural Character and Landscape Values of the Motukawa Race

As noted above, the Motukawa Race contains multiple structures along its length and is highly modified, being lined with concrete in a number of places. The vegetation along the race and around the Silt Pond consists of flat to gently rolling pasture and cropland, with a few small patches of exotic trees. Native plants such as flaxes, toe, sedges, rushes, and swamp kiokio are present as scattered individuals at various places along the margins, providing habitat and foraging opportunities for water birds, lizards, and terrestrial invertebrates.

2.6.2 Geology of the Motukawa Race

The geology of the Motukawa Race predominantly comprises of late Quaternary river deposits (Gravel) and Early Pliocene to Late Miocene sandstones interbedded with siltstone (sedimentary weak sandstone). The river deposits will be highly erodible as they are likely to be unconsolidated.

The Sediment Assessment by Tonkin & Taylor (attached as **Appendix G** to this AEE) also observed peat type soils (mapped as 'Orthic Gley Soils') within the race. The peat is likely Holocene swamp deposit that is prone to waterlogging and will contain large organic debris (e.g. tree roots / logs). When waterlogged, peats are naturally cohesive and have a low erodibility.

The race has a steep longitudinal profile, with its banks comprising of saturated peats with considerable coarse organic debris. The bed of the Motukawa Race comprises of primarily in-situ clays.

2.6.3 Hydrology of the Motukawa Race

Flow in the Motukawa Race is primarily monitored by Trustpower at the Tariki Weir. In addition to the flow diverted from the Manganui River, the Motukawa Race is supplemented with flows from surrounding tributaries that feed into the race (as well as stormwater runoff). The two main tributaries that feed directly into the race are drains located downstream of the Tariki Weir.

The mean flow in the Motukawa Race for the period from 2010 to 2020 is approximately 3.16 m^3/s, and the median flow is approximately 3.33 m^3/s. On average a flow of 5.0 m^3/s is exceeded in the Motukawa Race approximately 13% of the time.

2.6.4 Fish Entrainment within the Motukawa Race

The in-race generator has a trash screen with a 75 mm spacing which reduces the potential for debris from entering the in-race generator's turbine. This trash screen is unlikely to exclude large and small fish from entering the turbine (refer to Figure 6 below).

Kaplan turbines are propeller type water turbines and are considered to generally provide safe passage for small fish, due to their low head and slow rotation. However, larger fish (adult eel and adult trout) would be more susceptible to damage and even mortality if they were to pass through the trash screen.

When the bypass valve located adjacent to the in-race generator is open (between 1 November and 28 February each year), any fish in the Motukawa Race are able to pass unimpeded down towards Lake Ratapiko.

Figure 6: In-Race Generator Components

2.6.5 Aquatic Ecology of the Motukawa Race

The aquatic ecology of the Manganui River has been assessed in section 2.5.4 of this AEE, and is relevant given water from the river is diverted into the Motukawa Race.

Fish recovery in the Motukawa Race in 2021 (in association with sediment removal works) recovered a total of 101 shortfin eels and one kōura. These fish were released into the

Manganui River. Crans Bully, Longfin eel, brown trout, and perch have also been recorded within the Motukawa Race, as were two juvenile lamprey within the Silt Pond in March 2021.

It is noted that the Motukawa Race traverses a largely rural environment with limited riparian planting along its length and is, therefore, likely affected by nutrient runoff which degrades water quality, namely nitrogen and faecal bacteria as a result of the surrounding agricultural land use.

2.7 MANGAOTEA STREAM

The Mangaotea Stream is a tributary of the Manganui River, which emanates just north of Makara Road and extends to the Manganui River (joining just east of Ngaro Road). The stream is approximately 5 km long and traverses through pastoral farmland. It passes under the Motukawa Race / Mangaotea Aqueduct approximately 2.8 km downstream from its source and continues adjacent to Mangaotea Road for a further 800 m before it crosses under Tariki Road via a culvert.

The length of the Mangaotea Stream upstream of Tariki Road is largely devoid of riparian vegetation, whereas the downstream length has trees and shrubs along the majority of the stream margin. The Mangaotea Stream and the wider catchment area are prone to flooding during high rainfall events.

Boffa Miskell has identified that the Mangaotea Stream has a 'low' level of natural character. In this regard, the stream traverses through pastoral farmland and is highly modified with several culverts apparent along its length.

Water has previously been drawn from the Mangaotea Stream into the Motukawa Race via a pump in the bed of the stream. However, this was discontinued in 2018 and is not being reconsented by Trustpower. The existing consents do, however, provide for the discharge of water from the Motukawa Race into the stream, and Trustpower is seeking a new resource consent for this activity.

2.8 LAKE RATAPIKO AND THE MAKO STREAM

Lake Ratapiko is a man-made lake that was formed in 1927 by the flooding of several shallow stream valleys, including the Mako Stream. The western arm of the lake receives water from the Motukawa Race, which provides approximately 88% of the lake's inflows. The balance of the lake inflow is derived from the Mako Stream, unnamed tributaries to the lake, and minor drainage channels intercepted by the Motukawa Race. Pumped flows from the Mangaotea Stream previously provided less than 1% of total inflows to the lake, but as noted above these flows were ceased in 2018.

Lake Ratapiko is approximately 3 km long and 21 ha in area, with an average depth of 2.5 m.

The lake is surrounded by pastoral farming activities with narrow vegetated riparian margins. The value of this lakeshore vegetation is low due to a predominance of exotic species. The lake and lake edge provide habitat for water birds, however, is subject to relatively high levels of disturbance in summer months due to water sports occurring in the lake.

The Ratapiko Dam and associated spillway structures across the Mako Stream at the southern end of the lake are obvious man-made features in the lake margin. The Motukawa Power Station intake structure is located at the end of the eastern arm of the lake (previously the upper reach of the Mako Stream).

2.8.1 Natural Character and Landscape Values of Lake Ratapiko

Boffa Miskell consider that Lake Ratapiko has a 'moderate' level of natural character. While the lake's presence is completely artificial, it has naturalised over the decades and has (limited) intrinsic qualities and natural characteristics of a lake.

The lake level regime is heavily modified, contains numerous structures within and on its banks, with riparian vegetation primarily consisting of exotic species in the context of a dominant rural landscape.

2.8.2 Geology of Lake Ratapiko

The geology of Lake Ratapiko mostly consists of peat type soils, similar to the Motukawa Race (as described in section 2.6.2 above). Tonkin & Taylor observed unconsolidated fine sediment overlying a cohesive clay on the bed of Lake Ratapiko, with a mix of in-situ clays or rocks and less fine sediment more apparent in the eastern arm of the lake.

2.8.3 Lake Sedimentation Conditions

Tonkin & Taylor assessed the sedimentation conditions of Lake Ratapiko and have identified that:

- Approximately 70% of the Manganui River sub-catchment within which the lake is located is pasture, and streams in pasture generally have a greater sediment yield than those under forested areas. While Mount Taranaki is a largely pristine environment with dense native vegetation, the geology consists of steep slopes and recent volcanic soils which can generate large pulses of sediment during large rainfall events. Both of these processes are likely to influence sediment levels in Lake Ratapiko;
- There are four main contributing sources of sediment to Lake Ratapiko, being:
  - The Manganui River catchment – up to the diversion weir before water is diverted through the Motukawa Race;

- The Motukawa Race – containing water diverted from the Manganui River and any drainage channels entering the race;
- The Mako Stream catchment; and
- The Lake Ratapiko local catchment – with natural tributaries draining directly into the lake.

- Lake Ratapiko is a sediment sink, meaning it does not have sufficiently high flow velocities to flush out sediment that is being contributed from surrounding tributaries. Sediment introduced to Lake Ratapiko is most likely to remain in the embayment closest to the location of the inflow; and
- The estimated total suspended sediment load entering Lake Ratapiko from the catchments is 693 tonnes/year (a volume of approximately 475 m^3/year[4]). However, very limited sediment depositions were observed on the exposed surfaces of the lake, suggesting the lake has generally low rates of sedimentation.

2.8.4 Hydrology of Lake Ratapiko

As identified by Tonkin & Taylor, flood flows in Lake Ratapiko come from two sources:

- Flows conveyed by the Motukawa Race and the Mako Stream to the lake (and the floodplain of the Mangaotea Stream in extreme weather events); and
- Runoff from the local catchment draining to Lake Ratapiko.

The useable lake storage between the minimum and maximum consented normal operating levels is 695,000 m^3. The maximum consented level of Lake Ratapiko is 198.70 m RL. The mean spill flow is approximately 0.031 m^3/s, with the dam spilling 0.3% of the time on average.

The spillways at the Ratapiko Dam are able to convey the 100-year Average Recurrence Interval ("**ARI**") flood. The 1,000 year ARI flood cannot be passed solely by the spillways, and requires overtopping of the dam crest.

The fluctuations in the level of Lake Ratapiko reflect the pattern of electricity generation demand at the Motukawa Power Station. The Hydrology Report by Tonkin & Taylor provides time-series of the Lake Ratapiko water level from January 2016 to December 2020. Figure 7 below provides a water level time-series for a three-month period between September and November 2020, which indicates that the amplitude of daily fluctuations is typically between 0.25 m and 0.4 m.

[4] Based on a wet density of silty sand and gravel of 1.46 tonnes/m^3

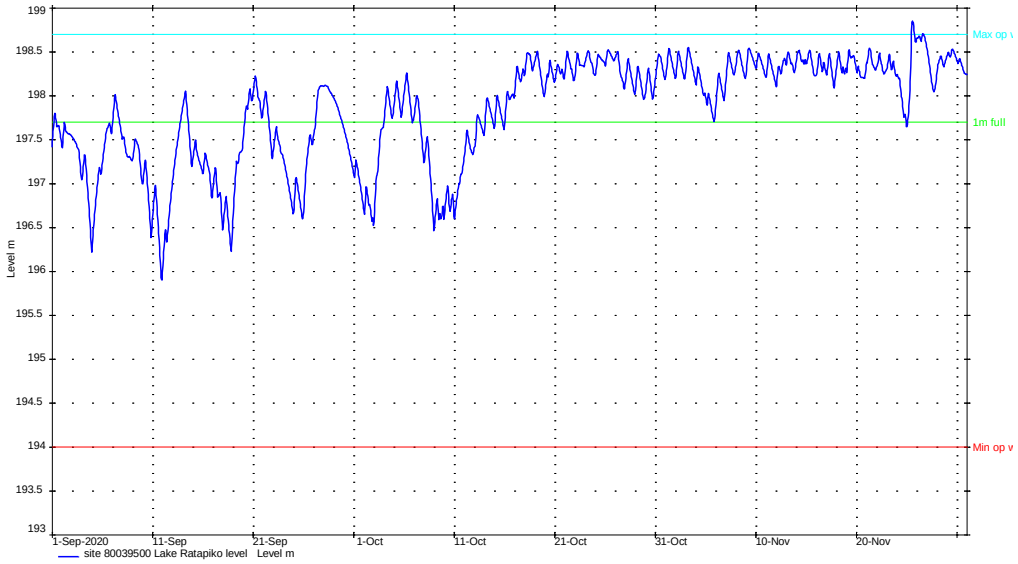

Figure 7: Lake Ratapiko Water Level Time Series (September 2020 to November 2020)

2.8.5 Fish Passage from Lake Ratapiko

The Mako Stream was dammed to form Lake Ratapiko and results in a physical barrier for fish migrating upstream. To remedy this, an elver pass (a small pipe with a small water supply from a hose) was constructed adjacent to the service spillway of the dam, providing upstream passage between the Mako Stream and Lake Ratapiko (refer to Figure 8).

Bullies, longfin eel and brown trout have all been recorded in the Mako Stream further downstream of the dam, indicating the elver passage enables sufficient fish passage.

Figure 8: Ratapiko Dam Spillway Elver Pass

In the eastern arm of Lake Ratapiko, water is piped through a tunnel and penstock to the Motukawa Power Station. The intake to the tunnel and penstock is currently screened to primarily prevent trash, rather than fish, from entering the tunnel, and the structure has a mechanical cleaner (refer to Figure 9 below).

Ryder Environmental concludes that fish may be able to avoid impingement against the trash screen, however, some may also be able to swim through the screen and through to the Motukawa Power Station (and, therefore, be impacted by the turbines). Passage through the turbines is likely to result in mortality for most large fish, particularly migrating adult longfin and shortfin eels. A fish trap and transfer programme occurs at the tunnel intake to assist with the reduction of fish entering the tunnel, and an electrical field device helps deter fish from passing through the trash screen.

Figure 9: Trash Screen at Lake Ratapiko Power Station Intake

2.8.6 Aquatic Ecology of Lake Ratapiko

Monitoring undertaken by the TRC within Lake Ratapiko between 2018 - 2021 found that 100% of water samples met the freshwater microbiological water quality guidelines (MfE, 2003) and did not exceed the 'Action' level (>550 *E. coli* cfu/100mls). Cyanobacteria is typically not found in the lake and was not uncovered as a result of the monitoring by the TRC. There was one occurrence of picocyanobacterial uncovered during monitoring in February 2019, however this was short term and considered an anomaly.

Monthly monitoring undertaken in Lake Ratapiko between November 2020 and April 2021 indicated nutrient levels within the lake were well within relevant NOF bottom lines for lakes (i.e. total nitrogen, total phosphorus and ammonia (toxicity)), noting that a full year of data is not yet available.

Freshwater mussels and shrimp have been recorded in Lake Ratapiko, and fish species present in the lake and its tributaries include common / Cran's bullies, longfin eels, shortfin eels, brown trout and perch.

The lower section of the Mako Stream receives seepage flow from the Ratapiko Dam (approximately 5 l/s) and the spillway overflows when the lake level is high. Monitoring undertaken in the Mako Stream immediately downstream of the dam indicated a maximum temperature of 20.5°C in February 2020. This temperature is below critical temperatures for native fish and brown trout, below the critical thermal maxima temperatures for native fish species, and also below the acute (24.6 °C) and chronic (19.6 °C) criteria for brown trout.

2.9 MAKARA STREAM AND THE WAITARA RIVER

The Makara Stream is a tributary of the Waitara River and drains a small catchment in steep hill country used for extensive pastoral farming and forestry. Water abstracted from Lake Ratapiko is conveyed to the Motukawa Power Station for hydro-electricity generation purposes before being discharged into the Makara Stream.

The Makara Stream is steep, fast flowing and deeply incised landform, with flows influenced by the Motukawa Power Station.

Vegetation within the wider downstream landscape of the Makara Stream comprises predominantly developed pasture with numerous patches of introduced or indigenous scrub and forest. Land use in the surrounding landscape consists of extensive farmland, production forestry, and areas of indigenous forest set within elevated hill country.

The Waitara River begins in the Moki Ranges and flows generally south before turning west towards the coast near Matau. The river has a reasonably low overall gradient of 0.18%. The width of the Waitara River increases with distance downstream, but maintains a relatively consistent width of between 30 – 50 m after leaving the hill country. The channel is predominantly an incised meandering fine-grained river system.

Vegetation along the Waitara River predominantly comprises developed pasture with numerous patches of introduced and/or indigenous scrub and forest.

2.9.1 Natural Character and Landscape Values of the Makara Stream and the Waitara River

Boffa Miskell have assessed the natural character and landscape values of the various reaches of the Waitara River catchment affected by the Motukawa HEPS, including the Makara Stream, Waitara River from the Makara Stream to the Manganui River confluence, and the Waitara River from the Manganui River confluence to the Tasman Sea. This assessment is summarised below:

- The Makara Stream has a 'moderate' level of natural character. The flow of the stream is modified by discharges from the Motukawa Power Station to the tailrace. There is a presence of structures along the length of the Makara Stream, including an outfall structure associated with the Motukawa HEPS, and road bridge abutments and culverts. Most of the vegetation along the stream's margins consist of exotic species impacted by the surrounding agricultural context, however patches of native bush and shrubland are evident in places;
- The Waitara River from Makara Stream to the Manganui River confluence has a 'moderate-high' level of natural character. The flow regime is slightly increased at the Makara Stream confluence by the Motukawa HEPS generation outflows. Instream structures are confined to river crossings at Bristol Road and Tarata Road. The landscape context is predominantly farmland, with energy generation facilities and overhead power lines also apparent. The river is not easily visible apart from at road crossings; and
- The Waitara River from the Manganui River confluence to the Tasman Sea has a 'moderate' level of natural character. The flow regime is unmodified by the Motukawa Power Station and varies mainly through weather and rainfall conditions. There are

numerous instream structures associated with river crossings. The river margins consist predominantly of exotic species with the surrounding landscape context dominated by farmland and urban development, along with pasture, parkland and urban development. The river is not easily visible apart from at road crossings and in locations where the adjacent roads are located near the riverbank.

2.9.2 Geology of the Makara Stream and Waitara River

The geology of the Waitara River catchment consists of approximately 50 % 'Orthic Allophanic' and 50 % 'Acidic Orthic Brown Soils'. Orthic Brown Soils are described as being weak soils, commonly on slopes or young land surfaces. These soils are considered to be highly erodible and will be contributing large amounts of silts and sands to both river systems.

The Makara Stream catchment is predominantly underlain with sandstone and siltstone, with a bed comprising a mix of gravels and fine-grained sediment. Similarly, the Waitara River catchment is predominantly underlain by sediment rocks such as siltstone and mudstone, with the bed likely comprising of predominantly fine-grained sediment (silts and sands).

2.9.3 Hydrology of the Makara Stream and Waitara River

When flows in the Waitara River are low, the existing consent conditions require water diverted from the Manganui River to pass continuously through Lake Ratapiko and the Motukawa Power Station into the Makara Stream.

Flow records from the synthetic gauge at the 'Waitara River above Makara Stream' location are analysed in the Hydrology Assessment, and provide further context to characterise the hydrology and water resources of the Makara Stream. The median flow of the Makara Stream upstream of the Motukawa Power Station is 180 l/s, and the mean annual flow at the Waitara River above the Makara Stream synthetic gauge (according to 2010 to 2020 monitoring) is 30.4 m^3/s.

2.9.4 Fish Passage in the Makara Stream

The Motukawa Power Station acts as a barrier to the upstream migration of fish (particularly elver) in the Makara Stream catchment.

An elver trap has been operating at the Motukawa Power Station since 2001 and has operated successfully, with an estimated 30,000 to 47,000 individuals being transferred on average each year to either the Manganui River upstream of the diversion weir or into Lake Ratapiko.

Recently, Trustpower diverted a nearby competing attractant flow so that it now discharges at the same point as the discharge from the elver trap (i.e. providing additional attractant flow to the trap).

2.9.5 Aquatic Ecology of the Makara Stream and Waitara River

The following sections have been informed by the Aquatic Ecology Assessment, prepared by Ryder Environmental.

2.9.5.1 Water Quality

Nutrients, Clarity and Bacteria

The TRC has five years' worth of monitoring at the 'Waitara Upstream' monitoring site, located approximately 1.5 km upstream of the confluence of the Makara Stream with the Waitara River (upstream of the Motukawa Power Station discharge). Over this period, nutrient and faecal bacteria concentrations indicate poorer water quality compared to the Manganui River - with water clarity also being low.

Additional monthly water quality monitoring was undertaken at a further three sites, two being at upstream and downstream locations along the Makara Stream and one in the Waitara River (approximately 0.4 km downstream from the Motukawa Power Station discharge). During the 2019 - 2020 and 2020 - 2021 monitoring periods, median values of nitrogen and phosphorus were higher in the Makara Stream downstream of the tailrace discharge than upstream. However, when the Motukawa HEPS was not generating, nutrient levels at the two sites were similar. This indicates that the discharge from the Motukawa HEPS tailrace appears to increase nutrient levels in the Makara Stream. Nutrient levels in the Makara Stream remained well within relevant NOF bottom lines (i.e. nitrate and ammonia (toxicity)) (NPSFM).

In terms of faecal bacteria concentrations, concentrations were either similar, or slightly higher at the upstream site than downstream. Very high *E. coli* concentrations were recorded at both the Makara Stream sites at times, with a maximum of (at least) 10,000 cfu/100 mL recorded at both sites in March 2021. Based on same day monitoring of Lake Ratapiko and the Makara Stream (between November 2020 and March 2021), there is no indication that the discharge from the Motukawa Power Station is increasing *E. coli* concentrations in the Makara Stream.

Water Temperature

A water temperature logger was installed in the Waitara River, below the Motukawa Power Station discharge (approximately 0.5 km downstream of the Motukawa Power Station), in May 2019. Water temperature monitoring data indicated maximum hourly water temperatures of 24.8 °C and maximum daily average temperatures of 22.3 °C in February 2020. These temperatures were below the critical thermal maxima temperatures for all native fish species. The maximum hourly temperatures exceeded incipient lethal temperatures of 'sensitive' benthic macroinvertebrate taxa (e.g. mayflies and stoneflies). The maximum daily temperatures were within the lethal range.

The pattern of water temperature variation in the Makara Stream downstream of the Motukawa Power Station discharge closely aligns with variation in the discharge, with water temperature in the stream increasing with generation flow, and typically within the range of thermal preferences for native fish species.

Dissolved Oxygen

A dissolved oxygen logger was installed in the Waitara River in May 2019 immediately downstream of the confluence of the Motukawa Power Station and the Makara Stream (approximately 0.5 km downstream of the Motukawa Power Station) to understand dissolved oxygen concentrations in the river.

The monitoring site results indicated, that between May 2019 and January 2021, dissolved oxygen concentrations were typically above the minimum acceptable states set out in the NPSFM.

The pattern of dissolved oxygen variation typically decreases with Motukawa HEPS generation flow. However, for the entire monitoring period, dissolved oxygen concentrations at the downstream monitoring site were above the NPSFM acceptable state of a 7-day mean minimum of 5.0 mg/L, and a 1-day mean minimum of 4.0 mg/L. There were however periods where dissolved oxygen levels fell below 4.0 mg/L, and this coincided with times when there was no generation discharge from the Motukawa Power Station.

2.10 CULTURAL VALUES

Based upon the consultation it has undertaken, Trustpower understands that Ngāti Maru and the Pukerangiora hapu are mana whenua for the area in which the Motukawa HEPS is located. Other iwi and hapu that hold interests in aspects of the Motukawa HEPS include Ngati Rahiri, Manukorihi, Puketapu, Otaraua, Ngāti Mahanga, Ngāti Mutunga and Te Atiawa.

As is discussed further in section 7 of this AEE, Trustpower have been engaging with iwi and hapu that are mana whenua or have an interest in the Motukawa HEPS since 2018, in order to establish an understanding of the cultural and historical associations of iwi and hapu with the Scheme (and the waterbodies it interacts with). In this regard, several hui have been undertaken, and Ngāti Maru and Pukerangiora are proposing to prepare a cultural values assessment for the reconsenting of the Scheme – although this has been delayed, in part, due to the recent COVID-19 outbreaks across New Zealand.

That said, some understanding of the values of iwi and hapu is provided by the Environmental Management Plan of Te Atiawa (Tai Whenua, Tai Tangata, Tai Ao) which notes the following:

Maru is the personification of the freshwater ecosystem. All water originated from the separation of Papatūānuku and Ranginui. Water sustains the growth of plants, animals and our people. It is fundamental to all aspects of life and is essential to our health and wellbeing. As kaitiaki, Te Atiawa are responsible for protecting, maintaining and enhancing the mauri of Maru.

In resource management, Te Mana o Te Wai is a matter of national importance that must be recognised and provided for. This section provides context to this matter of national importance within our Te Atiawa rohe.

The relationship between Te Atiawa and freshwater is acknowledged by the Crown through Statutory Acknowledgements in the Te Atiawa Deed of Settlement which includes all waterways within our Te Atiawa rohe. A statutory acknowledgement requires that all consent authorities must send to Te Atiawa (see Section 4.3 Dual Notification) copies of any consent for an activity within, adjacent to or impacting directly on these areas. A copy of the Statutory Acknowledgements and Statements of Association are included at Schedule 1.

In addition, it is noted that:

- The Manganui River and its tributaries are a statutory acknowledgement area, as a result of the Te Atiawa Claims Settlement Act 2006 and the Ngaruahine Claims Settlement Act 2006. Te Atiawa have also identified the river as being in the rohe of Pukerangiora and Otaraua hapu; and
- Everett Park Scenic Reserve is a statutory acknowledgement area, as a result of the Te Atiawa Claims Settlement Act 2006. The reserve is identified in the statutory acknowledgement as being in the rohe of Pukerangiora hapu, and the social, cultural, historical and spiritual importance of the reserve is illustrated through Te Atiawa traditions and histories. The traditions and histories also represent the spiritual links and an unbroken continuity with Te Atiawa tipuna and present generations and reinforce Te Atiawa tribal identity.

Further information on the values of iwi and hapu with the environment around the Motukawa HEPS will be provided once the cultural values assessment is provided by Ngāti Maru and Pukerangiora in due course.

2.11 RECOGNISED FEATURES, LANDSCAPES, AREAS, ECOSYSTEMS AND TREES

2.11.1 Natural Features and Landscapes

The Taranaki Regional Policy Statement ("**RPS**") and the RFWP identify the Manganui River and the Waitara River as catchments with high natural, ecological and amenity values. These values are generally higher upstream towards Egmont National Park and diminish slightly as the rivers traverse the modified landscape context downstream.

The RFWP recognises the upper reaches of the Manganui River (upstream of the diversion weir) as being an Outstanding Freshwater Body. The RPS recognises the reach of the river down to the confluence with the Waitara River as a high value waterbody.

The recognised values and significance of the Manganui River, as detailed in the RFWP, include:

- Regionally important water quality;
- Regional significance for native fishery habitat values;
- Highly valued recreational fishery - very popular and highly rated for high-quality fly-fishing for both brown and rainbow trout;
- Very highly rated for recreational uses and values (including some swimming, kayaking and rafting);
- Very highly rated for aesthetic and scenic values; and
- Natural flow which contributes significantly to aesthetic and scenic values.

The RFWP also recognises the Waitara River (middle reaches), as being highly rated for aesthetic and scenic values. Parts of the Waitara River are also recognised by the RFWP as a river with high natural character, ecological, recreational and amenity values. This includes regionally significant values such as a trout fishery, and in the lower reaches angling and white baiting.

There are no Outstanding or Regionally Significant Landscapes or Outstanding Natural Features identified in Operative New Plymouth District Plan ("**Operative District Plan**") and no Outstanding Natural Character Areas or Natural Features and Landscapes identified in the Proposed New Plymouth District Plan ("**Proposed District Plan**") within or surrounding the Scheme. Furthermore, neither the Operative nor Proposed District Plans identify Lake Ratapiko as a priority or significant waterbody.

2.11.2 Significant Natural Areas

The Operative District Plan does not identify any significant natural areas in the vicinity of the Motukawa HEPS. However, the Proposed District Plan identifies two significant natural areas on the Manganui River upstream of the diversion weir, and six sites along the Waitara River upstream of the Bristol Road Bridge.

The significant natural areas along the margins of the Manganui River are described as a "*Tawa forest, mahoe-porokaiwhiri forest*" and a "*Tawa forest with few rimu and kahikatea*", approximately 200 m upstream from the diversion weir.

Two of the significant natural areas along the Waitara River are located beside the Tarata Cemetery, and three are located 3 km upstream of the Bristol Road bridge (one of which is identified as "*Rewarewa / tawa-(hinau) forest, rewarewa / ponga-mamaku-horoeka*

treefern land, some gorse shrubland". Another significant natural area is located on the true right of the Waitara River on Tikorangi Road West, approximately 4 km downstream of the Manganui – Waitara River confluence.

The significant natural areas outlined above are described further within the Terrestrial Ecology Assessment by Ryder Environment (which is attached as **Appendix H**).

2.11.3 Key Native Ecosystems

Key Native Ecosystems ("**KNE**") are listed in the TRC's inventory of sites with indigenous biodiversity values of regional significance. The TRC have identified a number of KNEs within the vicinity of the Motukawa HEPS, which include:

- The Pirinoa KNE is located on privately owned land on the true left of the Manganui River, approximately 4.5 km downstream from the diversion weir. This is also a QEII Trust covenant approximately 1.3 ha in area;
- The Everett Park KNE is located adjacent to the Manganui River on the true left bank, approximately 15 km – 18 km downstream of the diversion weir; and
- The Hann Bush and Kahikatea Block KNE is located approximately 300 m from the intake to the Motukawa Power Station on Lake Ratapiko. These sites also comprise two QEII Trust covenants of 5.48 ha and 6.06 ha in area.

These KNE's are described further within the Terrestrial Ecology Assessment.

2.11.4 Significant Trees

The Operative District Plan lists 'notable trees', some of which are located near the Waitara River, however, are set far back from the riverbank and are / will not be affected by the Motukawa HEPS. With the exception of one pohutukawa tree, all of these notable trees are introduced species of limited ecological value.

2.12 RECREATIONAL FEATURES AND RECOGNITION

A range of recreational activities are undertaken within the vicinity of the Motukawa HEPS, which are described further in the Recreation Assessment by Rob Greenaway & Associates (attached as **Appendix I**).

The Manganui River, particularly the upper reaches within or near the Egmont National Park, is very popular and highly rated for high-quality fly-fishing for both brown and rainbow trout. In addition, the headwaters within the park are viewed and enjoyed by the thousands of people each year who use the ski-field walking track. The river is also used for kayaking and rafting during high river flows from upstream of Everett Park. Everett Park Scenic Reserve is a popular destination for walking and swimming.

Lake Ratapiko is a popular destination in the summer months for water sports, predominantly jet boating and water skiing, but also kayaking and swimming. Fishing is also undertaken within the lake. The publicly accessible margins of the lake (although owned by Trustpower) are used and managed by the water skiing and jet boating clubs who both have clubroom facilities on its shores that are maintained as parkland with mown grass, shade trees, buildings, boat ramps and timber retained edges to facilitate the recreational uses.

The upper reaches of the Waitara River are known for a number of recreational activities, notably fishing for trout. Whitebaiting is also undertaken in the lower reaches.

The majority of the Manganui and Waitara River reaches and tributary streams that are affected by the Scheme are not visible from publicly accessible locations such as parks or esplanade reserves (with the exception of Everett Park Scenic Reserve and local roads that cross the rivers at various locations).

3. PROPOSAL

3.1 INTRODUCTION

As noted in section 1 of this AEE, Trustpower is seeking all necessary resource consents from the TRC for the continued operation, use and maintenance of the Motukawa HEPS in response to the forthcoming expiry of the existing resource consents in June 2022. The operating regime for the Motukawa HEPS will remain largely the same as currently authorised, with the following exception:

- Trustpower will no longer take water from the Mangaotea Stream into the Motukawa Race.[5]

Furthermore, it is noted that Consents 10889 and 10890, which relate to the dredging of the Silt Pond and maintenance works in the Motukawa Race, do not expire until 1 June 2039 and do not form part of the suite of new resource consents being sought by Trustpower at this time.

The key activities that will comprise the continued operation, use and maintenance of the Motukawa HEPS are summarised as follows:

- The damming of water in the Manganui River via an existing concrete diversion weir and intake structure;
- The take and diversion of up to 5.2 m^3/s of water from the Manganui River for hydro-electricity generation purposes;
- The use and maintenance of an existing diversion weir, intake structure and fish passes in the bed of the Manganui River;
- The discharge of water and contaminants over an existing diversion weir and fish passes located in the bed of the Manganui River;
- The discharge of water and contaminants to the Manganui River via the sluice gate downstream of the intake structure;
- The damming of water in the Motukawa Race via an existing small weir;
- The use and maintenance of an existing small weir in the Motukawa Race;
- The diversion and take of water from the Motukawa Race for hydro-electricity generation purposes (via the in-race generator);
- The discharge of water to the Motukawa Race via the existing in-race generator;

[5] In this regard, Consents 6381, 6382, 6383, 6384, 6385, 6386 and 6387 – 6387-1 will expire and will not be replaced by Trustpower.

- The use and maintenance of the existing Mangaotea Aqueduct over the Mangaotea Stream;
- The discharge of up to 2,000 l/s of water from the Mangaotea Aqueduct into the Mangaotea Stream;
- The diversion and use of up to 8,000 l/s of stormwater runoff and flows from various unnamed watercourses that drain into the Motukawa Race and Lake Ratapiko;
- The damming of the Mako Stream via an existing earth dam;
- The use and maintenance of an existing earth dam structure in the bed of the Mako Stream;
- The discharge of water from Lake Ratapiko via existing spillways and lake drainage values to the Mako Stream;
- The disturbance of the bed of Lake Ratapiko by dredging for maintenance purposes;
- The establishment and use of a temporary dredging platform in the bed of Lake Ratapiko;
- The removal of vegetation from the margins of Lake Ratapiko for maintenance purposes;
- The discharge / deposition of up to 10,000 m^3/year of dredged material from Lake Ratapiko onto land;
- The use and maintenance of various existing structures in, on and over the bed of Lake Ratapiko;
- The discharge / spraying of aquatic herbicides along the margins of Lake Ratapiko to manage unwanted aquatic plants;
- The take of up to 7,787 l/s of water from Lake Ratapiko for hydro-electricity generation purposes;
- The discharge of up to 2,000 l/s of water from an existing surge chamber during maintenance periods to an unnamed tributary of the Makara Stream; and
- The discharge of water from the Motukawa Power Station to the Makara Stream.

Further details on each of these key components of the Motukawa HEPS, and the operating conditions proposed by Trustpower, are provided in the following sub-sections.

3.2 MANGANUI RIVER TAKE AND DIVERSION

3.2.1 Water Take / Diversion from the Manganui River

As discussed in section 2 of this AEE, a concrete diversion weir is located across the Manganui River approximately 100 m downstream of Tariki Road bridge. Trustpower

proposes to continue to impound and divert / take water from the Manganui River via this weir to an intake structure located on the true-right of the river.

The maximum rate of diversion / take from the Manganui River proposed by Trustpower is 5.2 m^3/s, which algins with the diversion / take provisions of existing Consent 3369-2. Based on the Hydrology Report by Tonkin & Taylor, the mean annual flow of the Manganui River at the diversion weir is 6.88 m^3/s and the mean flow diverted into the Motukawa Race is 3.16 m^3/s. The monthly mean flows on the main stem of Manganui River are shown in Figure 3 of this AEE (section 2.5.3).

Trustpower proposes to maintain a residual flow of 400 l/s in the Manganui River downstream of the diversion weir, which is the same as the existing resource consent conditions for the Scheme.[6]

With the purpose of mitigating the effects of potential water temperature increases downstream of the diversion weir during summer, Trustpower proposes to maintain a higher flow in the river when the water temperature at a site located approximately 2.3 km downstream of the weir exceeds 25˚C for a period of 24 hours or until such time that the water temperature at the downstream site reduces to below 25˚C (based on a rolling one hour average).

Furthermore, Trustpower is proposing that in the event that the flow downstream of the diversion weir has not exceeded 13.3 m^3/s for a consecutive 30 day period commencing on 1 November and concluding on 31 March, the diversion from the Manganui River will be reduced for a continuous period of six hours during the next fresh that exceeds three times the median flow in order to allow a flushing flow of at least 13.3 m^3/s to pass down the river.

Further detail on these operating parameters are provided in the consent conditions proposed by Trustpower (and attached as **Appendix J** to this AEE).

3.2.2 Maintenance of the Diversion Weir

No changes are proposed to the existing configuration or maintenance regime for the diversion weir or fish passes in the Manganui River. The diversion weir constitutes a large dam in accordance with the NZSOLD Guidelines (due to its height of approximately 4 m), and Trustpower will continue to manage the weir in accordance with the surveillance and monitoring requirements in the NZSOLD Guidelines.

The existing fish passes on the true right and left of the diversion weir will continue to be maintained by Trustpower, with the fish pass on the true right bank continuing to be the primary source of the residual flow downstream of the weir (approximately 300 l/s), and

[6] Consent 3369-2, Condition 1.

the fish pass on the true left bank providing the remaining 100 l/s of residual flow (approximate). Maintenance activities typically include the clearance of debris from the pools within the fish passes, and the restoration of the boulders that form the pools (which can sometimes be moved during higher flows). This maintenance typically occurs by hand.

3.3 MOTUKAWA RACE

Trustpower proposes to continue to divert water from the Manganui River, via the Motukawa Race, to Lake Ratapiko.

3.3.1 Intake Structure

No changes are proposed to the existing configuration or maintenance regime for the intake structure at the head of the Motukawa Race (including the 150 mm spacing of the trash screen and the existing electrical barrier).

The intake gates will continue to be utilised to control inflow to the race in order to ensure that the required residual flow is able to be maintained in the Manganui River and to control inflow to limit the potential for the Motukawa Race to contribute to localised flooding. Further detail on the operation of the intake structure / gates is provided in the Hydraulic and Geotechnical Assessment by Riley Consultants (attached as **Appendix K**).

3.3.2 Sluice Gates

As noted in section 2, a set of sluice gates are located approximately 80 m along the Motukawa Race and have an associated return channel which connects / discharges to the Manganui River at a point approximately 675 m downstream of the intake.

The sluice gates do not currently seal tight, and therefore leak water into the return channel, providing an attractant flow of water which can result in fish from the river becoming trapped in the channel (as there is no ability to enter the race via the sluice gates).

In accordance with the recommendations provided by Ryder Environmental, and as discussed in section 5 of this AEE, Trustpower proposes to install a barrier on the vertical wall at the channel's outlet in order to restrict elvers and other species potentially making their way into the channel.

3.3.3 Silt Pond

As noted previously, the Silt Pond enables sediment to drop out of the water column before water is conveyed down the Motukawa Race and into Lake Ratapiko.

Trustpower holds resource consents for the dredging in the bed of the Silt Pond on an as-required basis, with approximately 500 m^3 of sediment being removed per annum. These

resource consents are not being renewed as part of these resource consent applications given that they do not expire until 2039.

3.3.4 Race Operation

Water will pass through the Silt Pond, and along the race before reaching the forebay of the existing small weir located in the race. Trustpower proposes to continue to utilise the existing small weir and associated 200 KW in-race generator.

The existing 75 mm spaced trash screen located within the dam forebay will continue to be utilised to deflect large debris from entering the in-race generator. Additionally, and in accordance with the existing operation of the Motukawa HEPS, Trustpower proposes to open the bypass valve located adjacent to the in-race generator from 1 November to 28 February each year (while generation from the in-race generator is continuing) to enable fish (but primarily trout) to pass through the dam.[7]

Trustpower proposes to continue managing water in the Motukawa Race by way of the race water level control system previously mentioned in section 2 of this AEE. This will enable Trustpower to monitor the inflow of water to the race from the Manganui River, and to manage water flow so to minimise the potential / risk of flooding on adjacent farmland attributable to the activities of the Motukawa HEPS. This will be achieved by way of measuring the water level (at a minimum of 15 minute intervals) and ensuring maximum race water levels are maintained.

Table 4 below details the existing maximum consented race water levels[8] at four locations along the race. Trustpower proposes to continue to operate the Motukawa Race at these levels.

Table 4: Existing Consented Race Water Levels

Location	Existing Maximum Consented Level (m RL)
Salisbury Road Bridge	205.20
Mangaotea Road Culvert	199.30
Mangaotea Aqueduct	199.25

[7] Consent 6390-1, Condition 5.

[8] Consent 6390-1, Condition 8; and Consent 3371-2.1, Condition 2.

Location	Existing Maximum Consented Level (m RL)
Lower Mangaotea	199.15

Trustpower have previously undertaken an observational approach to managing any slumping and erosion related matters within the Motukawa Race, with appropriate remedial actions undertaken as and when necessary. Trustpower proposes to continue implementing these measures. Further details on the proposed management of the Motukawa Race during normal operations and flood conditions are provided in the Hydraulic and Geotechnical Assessment.

The Motukawa Race will also require periodic maintenance. As with the existing consents,[9] during maintenance periods Trustpower proposes to maintain a flow of 150 l/s in the race. In the event that it is not practicable to maintain this flow, Trustpower will arrange a fish salvage operation that will enable the relocation of stranded fish from the race.

3.4 MANGAOTEA AQUEDUCT

To facilitate the crossing of the Motukawa Race over the Mangaotea Stream, Trustpower proposes to continue to utilise the existing Mangaotea Aqueduct.

As with the existing consents,[10] in the instance that water is required to be discharged to the Mangaotea Stream Trustpower proposes to discharge up to 2 m^3/s of overflow water from the Mangaotea Aqueduct into the Mangaotea Stream via an existing gate in the lowered northern side of the aqueduct (controlled by the race water level control system of the Motukawa Race).

3.5 MANGAOTEA STREAM INTAKE STRUCTURE

As previously noted, Consent 6385-1 authorised the installation and operation of a water intake structure (including pumps) in the Mangaotea Stream to facilitate the take and use of water from the stream for hydro-electricity generation purposes.

Trustpower no longer require the take and use of water from the Mangaotea Stream and has not utilised this consent since March 2018. As such, Trustpower is not applying for a resource consent for the take and use of water from the Mangaotea Stream to continue.

9 Consent 3369-2, Condition 7.

10 Consent 5081-1, Condition 2.

In accordance with Condition 8 of Consent 6385-1, which requires Trustpower to remove the Mangaotea Stream intake structure (and pumps) when the structure is no longer required, Trustpower proposes to remove:

- The existing pump house (down to the existing underlying concrete slab);
- The steep lifting frame;
- The HDPE pipe and supports;
- The cable trays and redundant wiring;
- The pumps and screen from within the existing concrete sump;
- Brush and supporting frames and hydraulic pipes; and
- The walkway across the aqueduct.

Condition 8 also requires Trustpower to reinstate the area of the intake structure once it is removed. Trustpower have discussed the reinstatement process with the TRC, who have agreed that the concrete sump within the bed of the Mangaotea Stream can remain in place, with it to be filled with aggregate / rock to reform / reinstate the stream bed to a condition similar to its natural state.

Trustpower propose to undertake this work in March / April 2022 when flows in the Mangaotea Stream are typically low. The existing diversion pipework in the area will be utilised to provide a dry work area whilst removing the pumps.

As indicated by Condition 8 of Consent 6385-1 above, the removal of the Mangaotea Stream intake structure and pumps are covered by the existing consents. As such, no further consent requirements are required as part of this resource consent application.

3.6 LAKE RATAPIKO AND THE MAKO STREAM

The following sub-sections detail how Trustpower intends to operate Lake Ratapiko for water storage for hydro-electricity generation purposes as part of this resource consent application (which will be predominantly consistent with the existing consent conditions for the Motukawa HEPS).

3.6.1 Diversion / Take to the Motukawa Power Station

Trustpower proposes to continue to take / divert up to 7.87 m^3/s of water from Lake Ratapiko to the Motukawa Power Station for hydro-electricity generation purposes. Water will pass through the lake's forebay (located at the eastern end of the lake) before being diverted through the intake structure in the bed of the lake to the tunnel and penstocks that convey water to the Motukawa Power Station.

Trustpower proposes to maintain the existing intake structure and the 37 mm – 40 mm spaced trash screen that blocks debris from entering the tunnel, and aids in deterring the entrapment of larger eels and fish into the tunnel.

In addition, to assist in reducing the entrapment of fish (predominantly eel) into the tunnel and Motukawa Power Station, and associated mortalities of fish species, Trustpower proposes to continue to operate and enhance a fish trap and transfer programme at the tunnel intake.

Further details of the trap and transfer programme are provided in section 5 of this AEE.

3.6.2 Mako Stream Discharge

The existing earth dam across the Mako Stream includes two spillways (a service spillway and an auxiliary spillway) that allow for the discharge of water from Lake Ratapiko to the Mako Stream. Trustpower proposes to continue to discharge water via the service spillway by way of water overtopping the flashboards mounted on the top of the spillway crest when the level of Lake Ratapiko exceeds 198.7 m RL.

Trustpower also proposes to continue to discharge water via the auxiliary spillway by way of a fuse plug that activates (washes out) to provide more flood capacity when the lake level exceeds 199.22 m RL.

In accordance with the provisions of Consent 5084-1, Trustpower is seeking resource consent to discharge up to 55 m^3/s of water via the existing spillways from Lake Ratapiko into the Mako Stream. The discharge of water via the spillways will occur as required for management purposes, but will typically occur during adverse weather conditions in the catchment.

Trustpower does not propose to provide a residual flow in the Mako Stream downstream of the Ratapiko Dam. In this regard, flows and fish passage in the Mako Stream have been restricted for over 90 years (as discussed further in section 5 of this AEE). It is noted however that Trustpower proposes to continue to maintain and operate the elver fish pass located adjacent to the Ratapiko Dam service spillway.

No changes are proposed to the existing configuration or maintenance regime for the Ratapiko Dam and associated structures, and the dam will continue to be operated subject to the surveillance and monitoring requirements of the NZSOLD Guidelines (discussed further in section 5 of this AEE).

3.6.3 Operation of Lake Ratapiko

Trustpower is seeking to continue to operate Lake Ratapiko within an operating range of 4.7 m below the crest of the spillway to the Mako Stream (198.7 m RL), with the minimum

operating level remaining at 194.0 m RL. The proposed operating range is the same as authorised as part of the existing resource consent.[11]

Fluctuations in the level of Lake Ratapiko will continue to be principally dictated by the following:

- The take and diversion of water from the Manganui River (contributing approximately 88% of lake inflows);
- Minor drainage channels intercepted by the Motukawa Race (contributing approximately 3.5% of lake inflows);
- Unnamed tributary inflows to the lake (contributing approximately 8% of lake inflows); and
- Demand for electricity generation via the Motukawa Power Station.

Trustpower will continue to manage Lake Ratapiko so that a minimum lake level of 194 m RL is retained at all times, except for when the lake is lowered for maintenance purposes annually. In the event that Lake Ratapiko needs to be drawn down for maintenance purposes, the process will occur gradually over a seven day period in order to minimise the potential for fish strandings.

3.6.4 Maintenance / Dredging of Lake Ratapiko

To maintain the operational performance of Lake Ratapiko, Trustpower is seeking resource consent for maintenance dredging in the bed of the lake.

The dredging will consist of the removal of up to 10,000 m^3 of sediment build up per year (the same volume provided for by the existing consents) on an as-required basis for the duration of the consent.

It is anticipated that the maintenance dredging will occur at the western (upstream) end of Lake Ratapiko, as illustrated in Figure 11 below.

[11] Consent 3373-2, Conditions 5 and 6; Consent 5087-1, Conditions 1 and 3.

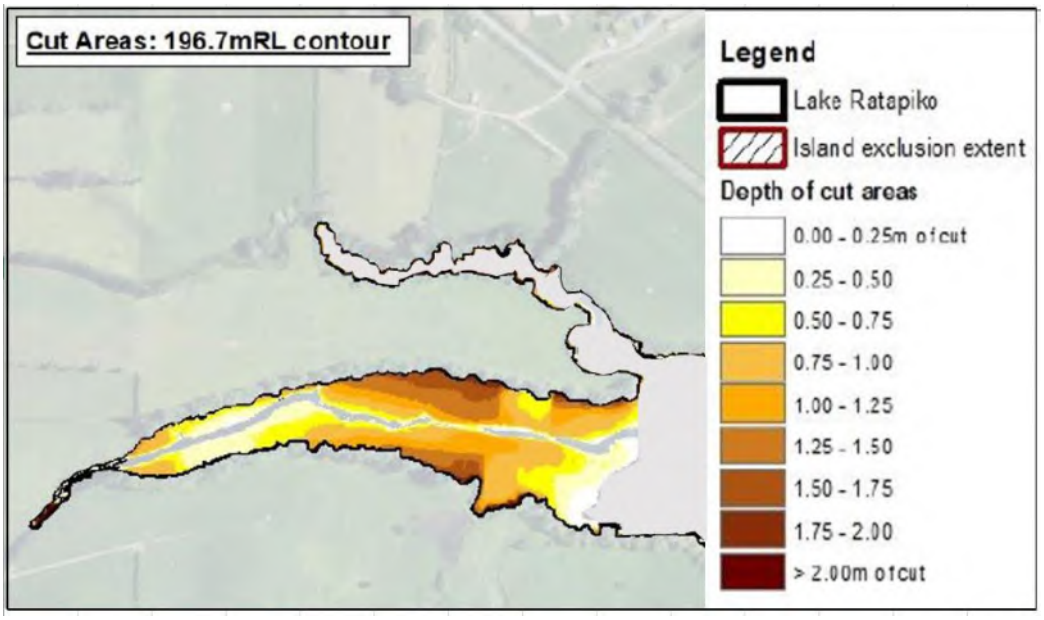

Figure 10: Proposed Dredging Location and Depths of Cut

Trustpower proposes to undertake the dredging during the 'dry' annual maintenance periods (typically a 2 – 4 week period commencing around the end of March) when Lake Ratapiko is lowered to approximately 195 m RL. Sediment will be removed from the dry lakebed edge from 196.7 m RL.

The dredging would occur via the establishment of temporary gravel hard-stand work platforms in Lake Ratapiko which will support drag line plant. The work platform areas will consist of compacted GAP 65 gravel which will provide a stable flat area for the drag line to work from. These work platforms will not be installed at the same time, but only as and when necessary, with each platform removed following the completion of dredging around the hard-stand area.

The proposed location of the temporary work platforms are illustrated in Figure 12 below.

Figure 11: Proposed Locations of Temporary Work Platforms

The dredged sediment will be deposited as fill onto surrounding farmland at a nominal fill depth of 200 mm. The approximate location of the areas for deposition of sediment are shown in Figure 13 below. Resource consent for the deposition of dredged sediment onto land is being applied for separately from the New Plymouth District Council.

Figure 12: Proposed Deposition Areas

In summary, the dredging works will involve:

- Preliminary and enabling works - including the lowering of the lake level, drying of exposed silt material, the formation of temporary access, clearance of obstructing vegetation, and the construction of hardstand areas in the bed of the lake to support dredging drag lines;
- Establishment of plant - including the transportation of a crane, bulldozer, dump truck, and long-reach excavator to site;
- Silt / sediment removal - including the extraction of silt in a systematic pattern from the hard-stand areas (to the depth of the accumulated sediment on the natural base level of the lakebed), deposition of extracted silt to adjacent deposition areas or the loading of silt onto a dump truck for disposal away from the extraction points; and
- Reinstatement and disestablishment - including reinstatement of disposal areas, reinstatement of the lake edge, reinstatement of temporary access tracks, disestablishment of the plant (removal of the crane, bulldozer, dump truck and excavator).

3.7 DISCHARGE OF WATER TO THE MAKARA STREAM

Water that is abstracted from Lake Ratapiko will be conveyed through the tunnel and penstock for a distance of approximately 2.8 km to the Motukawa Power Station, and then discharged into the Makara Stream, in accordance with the existing operating regime.

As per the existing resource consent conditions for the Motukawa Power Station,[12] Trustpower proposes to discharge up to 7.87 m^3/s to the Makara Stream.

As with the existing consents,[13] Trustpower is also seeking to provide for the discharge of up to 2 m^3/s of water from the surge chamber above the Motukawa Power Station into an unnamed tributary of the Makara Stream, which will only be undertaken during periods of maintenance on the tunnel and penstock. Any discharges from the surge chamber will continue to be managed so as to avoid or minimise potential damage to property downstream.

Trustpower proposes to continue to operate and maintain a trap and transfer programme in the Motukawa Power Station tailrace, facilitating the upstream migration of fish.

3.8 OVERVIEW OF PROPOSED CONTROLS FOR THE MOTUKAWA HEPS

Table 5 below provides a summary of the controls proposed by Trustpower as part of this resource consent application on the various activities that comprise the operation of the Motukawa HEPS. Further discussion on the basis for the proposed controls is provided in section 5 of this AEE.

Table 5: Proposed Controls for the Motukawa HEPS

Activity	Proposed Controls
The damming of water in the Manganui River, and the diversion and take of water from the Manganui River for hydro-electricity generation purposes	1. The take of water from the Manganui River limited to 5.2 m^3/s. 2. The provision of a residual flow of not less than 400 l/s in the Manganui River downstream of the diversion weir. 3. If the flow in the Waitara River at the Bertrand Road gauging site is less than or equal to 5,000 l/s, the flow in the upper Manganui River will either: › Pass directly over the diversion weir / fish passes into the Manganui River; or › Pass continuously through Lake Ratapiko [with provision for residual flow in the Manganui River] and the

[12] Consent 3372-2.

[13] Consent 5088-1.

Activity	Proposed Controls
	Power Station into the Makara Stream, and thence the lower Waitara River. 4. If the flow immediately downstream of the diversion weir has not exceeded 13.3 m^3/s for 30 days between 1 November and 31 March, the water take will be suspended for six hours during the next fresh event to allow a flushing flow of at least 13.3 m^3/s to pass downstream. 5. If the water temperature at a site located approximately 2.3 km downstream of the diversion weir exceeds 25˚C, a higher residual flow will be provided for 24 hours and then until such time that the water temperature at the downstream site reduces to below 25˚C (one hour rolling average). 6. A flow of 150 l/s will be maintained in the Motukawa Race during maintenance periods, and when not practicable to do so a fish salvage operation will be undertaken to relocate stranded fish. 7. Preparation and implementation of an Ecological Monitoring and Management Plan. 8. The implementation of a fish trap and transfer programme within the Silt Pond and Motukawa Race.
Use and maintenance of an existing diversion weir, intake structure and fish passes in the Manganui River	1. Maintain and operate the weir in accordance with NZSOLD Guidelines. 2. Two fish passes will be maintained at the diversion weir. 3. Maintain a trash rack with a bar spacing of 150 mm. 4. Install and maintain a barrier on the vertical wall of the outlet of the sluice gate channel.
Discharge water and contaminants from the diversion weir, fish passes and sluice gates	N/A

Activity	Proposed Controls
Damming of water in the Motukawa Race via an existing weir structure	1. From 1 November to 28 February each year, the bypass value will be opened to enable trout to pass through the dam. 2. Water in the Motukawa Race will be managed in accordance with the following maximum race water levels (metres above sea level): › 205.20 at Salisbury Road; › 199.30 at Mangaotea; › 199.25 at the Mangaotea Aqueduct; and › 199.15 at Lower Mangaotea.
Diversion and take of water from the Motukawa Race in association with an existing in-race generator	1. Install and maintain a fish screen with 75 mm bar spacing at the intake to the in-race generator.
Discharge of water from the Mangaotea Aqueduct into the Mangaotea Stream	1. Limit the discharge of water to 2,000 l/s of water from the Mangaotea Aqueduct into the Mangaotea Stream. 2. Manage the discharge so as to avoid or minimise the potential for the flooding of land and roads.
The diversion and use of stormwater run-off and the entire flows from various unnamed watercourse draining into the Motukawa Race and into Lake Ratapiko	1. Limit the diversion and use of up to 8,000 l/s of stormwater run-off and the entire flow of various unnamed watercourses draining into the Motukawa Race and Lake Ratapiko. 2. Water in the Motukawa Race will be managed in accordance with the following maximum race water levels (metres above sea level): › 205.20 at Salisbury Road; › 199.30 at Mangaotea; › 199.25 at the Mangaotea Aqueduct; and › 199.15 at Lower Mangaotea.

Activity	Proposed Controls
	3.
Damming of the Mako Stream via an existing dam structure to form Lake Ratapiko, including the service and auxiliary spillway structures	1. Maintain and operate the dam in accordance with the NZSOLD Guidelines. 2. Minimum lake water level of 194 m above mean sea level (except during periods of maintenance), and a maximum level of 198.7 m above mean sea level. 3. Maintain and monitor an elver fish pass at the service spillway.
Discharge water via existing spillways and lake drainage valves from Lake Ratapiko into the Mako Stream	1. Discharge limited to 55,000 l/s. 2. Manage the discharge of water from the Ratapiko Dam so as to avoid or minimise the potential flooding of adjacent farmland.
Disturbance of the bed of Lake Ratapiko for dredging, maintenance and repairs	1. Dredging area limited and volume of material that is dredged limited to 10,000 m^3 per annum. 2. Dredging limited to 1 March and 30 April. 3. Dredging shall only occur when the level of Lake Ratapiko is below 195 m mean sea level. 4. Install temporary hardstand gravel work platform areas in specified locations around the edge of the lake.
	1.
Take and use of water from Lake Ratapiko	1. Take limited to 7,787 l/s. 2. The maintenance of a 40 mm spaced fish screen at the penstock intake. 3. The maintenance and operation of an electrical barrier at the penstock intake. 4. The implementation of a fish trap and transfer programme. 5. A minimum lake water level of 194 m above mean sea level (except during periods of maintenance), and a maximum level of 198.7 m above mean sea level.

Activity	Proposed Controls
	6. The drawing down of the lake for maintenance purposes will occur gradually over a 7-day period.
Discharge of water from the Motukawa Power Station to the Makara Stream	1. The discharge of up to 7,787 l/s of water from the Motukawa Power Station. 2. The implementation of a fish trap and transfer programme at the Motukawa Power Station.
Discharge water from the surge chamber of the Power Station during maintenance periods to an unnamed tributary of the Makara Stream	1. Limit the discharge of water to 2,000 l/s of water from the surge chamber into the unnamed tributary of the Makara Stream.

4. RESOURCE CONSENT REQUIREMENTS

4.1 OVERVIEW

Trustpower is seeking all necessary resource consents from the TRC to authorise all activities associated with the continued operation, use and maintenance of the Motukawa HEPS.

Table 6 identifies the resource consents required for the continued operation, use and maintenance of the Motukawa HEPS in accordance with the RFWP. Table 6 also identifies those activities which will be undertaken in accordance with a permitted activity rule in either the RFWP or the RSP.

The continued operation, use and maintenance of the Motukawa HEPS is not considered to trigger any resource consents under the Freshwater NES as:

- The diversion weir is an existing structure and is, therefore, not subject to Subpart 3 of the Freshwater NES (Regulation 60);
- The Ratapiko Dam is also an existing structure but is not a weir, so does not fall to be considered under Regulations 72 or 73; and
- Vegetation clearance, earthworks and the take, use, damming, diversion of water for the operation of specified infrastructure are provided for as a permitted activity under Regulation 46 and the relevant conditions can be met (irrespective of whether a natural inland wetland is proximate to these activities).

Table 6: Resource Consent Requirements for the Motukawa HEPS

Activity	Commentary
Manganui River	
The damming of water in the Manganui River via an existing diversion weir and intake structure	As the upstream catchment is greater than 25 ha and the height of the weir exceeds 3 m (being 4 m), the damming of water is a **discretionary activity** under Rule 20 of the RFWP.
The take and diversion of up to 5.2 m^3/s of water from the Manganui River for hydro-electricity generation purposes	As the proposed rate of abstraction will exceed 1.5 l/s, the taking and use of water is a **discretionary activity** under Rule 16 of the RFWP.

Activity	Commentary
	As the upstream catchment is greater than 25 ha, the diversion of water is a **discretionary activity** under Rule 20 of the RFWP.
The use and maintenance of an existing diversion weir, intake structure and fish passes in the bed of the Manganui River	As the upstream catchment is greater than 25 ha and the height of the weir exceeds 3 m (being 4 m), the use of the existing diversion weir, intake structure and fish passes in the bed of the Manganui River is a **discretionary activity** under Rule 64 of the RFWP. The maintenance of the existing diversion weir, intake structure and fish passes in the bed of the Manganui River is a **permitted activity** under Rule 53 of the RFWP.
The discharge of water and contaminants over an existing diversion weir and fish passes located in the bed of the Manganui River	Given that the discharge may cause the disturbance of the bed of the Manganui River, the discharge of water and contaminants into the river is a **discretionary activity** under Rule 43 of the RFWP.
The discharge of water and contaminants to the Manganui River via the sluice gate downstream of the intake structure	Given that the discharge may cause the disturbance of the bed of the Manganui River, the discharge of water and contaminants into the river is a **discretionary activity** under Rule 43 of the RFWP.
Motukawa Race	
The damming of water in the Motukawa Race via an existing small weir	The damming of water in the Motukawa Race (as an artificial watercourse) is an **innominate activity** under section 14 of the RMA.
The take and diversion of water from the Motukawa Race for hydro-electricity generation purposes (in-race generator)	As the proposed rate of abstraction will exceed 1.5 l/s, the taking and use of water is a **discretionary activity** under Rule 16 of the RFWP. As the upstream catchment is greater than 25 ha, the diversion of water is a **discretionary activity** under Rule 20 of the RFWP.

Activity	Commentary
The discharge of water to the Motukawa Race via an existing in-race generator	The discharge of water to the Motukawa Race is a **permitted activity** under Rule 21 of the RFWP.
The use and maintenance of the existing Mangaotea Aqueduct over the Mangaotea Stream	The use of the existing Mangaotea Aqueduct over the Mangaotea Stream is a **permitted activity** under Rule 52 of the RFWP. The maintenance of the existing Mangaotea Aqueduct over the Mangaotea Stream is a **permitted activity** under Rule 53 of the RFWP.
The discharge of water from the Mangaotea Aqueduct into the Mangaotea Stream	As the discharge of water to the Mangaotea Stream has the potential to cause disturbance to the bed of the stream, the discharge is a **discretionary activity** under Rule 43 of the RFWP.
The diversion and use of up to 8,000 l/s of stormwater runoff and flows from various unnamed watercourses that drain into the Motukawa Race and Lake Ratapiko for hydro-electricity generation purposes	The diversion of stormwater into the Motukawa Race and Lake Ratapiko is an **innominate activity** under section 14 of the RMA. The use of stormwater from the Motukawa Race and Lake Ratapiko is an **innominate activity** under section 14 of the RMA. As the upstream catchments may be greater than 25 ha, the diversion of flows from various unnamed watercourses that drain into the Motukawa Race and Lake Ratapiko is a **discretionary activity** under Rule 20 of the RFWP. The use of water from various unnamed watercourses is a **discretionary activity** under Rule 16 of the RFWP.
Lake Ratapiko (and Mako Stream)	
The damming of the Mako Stream via an existing earth dam	As the upstream catchment is greater than 25 ha, the height of the dam exceeds 3 m (being 14 m) and the dam restricts the passage of fish, the damming of water in the Mako Stream is a

Activity	Commentary
	discretionary activity under Rule 20 of the RFWP.
The use and maintenance of an existing dam structure in the bed of the Mako Stream	As the dam and spillways restrict the passage of fish down the Mako Stream, the use of the existing earth dam in the bed of the Mako Stream is a **discretionary activity** under Rule 64 of the RFWP. The maintenance of the existing dam is a **permitted activity** under Rule 53 of the RFWP.
The discharge of water from Lake Ratapiko via existing spillways and lake drainage valves into the Mako Stream	As the discharge of water to the Mako Stream has the potential to cause disturbance to the bed of the stream, the discharge of water into the Mako Stream is a **discretionary activity** under Rule 43 of the RFWP.
The disturbance of the bed of Lake Ratapiko by dredging for maintenance purposes	The disturbance of the bed of Lake Ratapiko by dredging is a **controlled activity** under Rule 75 of the RFWP.
The establishment and use of a temporary platform structure in the bed of Lake Ratapiko as part of the maintenance dredging	The establishment and use of a temporary platform in Lake Ratapiko is a **permitted activity** under Rule 53 of the RFWP.
The removal of vegetation from the margins of Lake Ratapiko for maintenance purposes	The removal of vegetation from the margins of the lake is a **permitted activity** under Rule 1 of the RSP.
The use and maintenance of various existing structures in, on and over the bed of Lake Ratapiko	The use of various existing structure in, on and over the bed of Lake Ratapiko is a **permitted activity** under Rule 52 of the RFWP. The maintenance of various existing structures in, on and over the bed of Lake Ratapiko will be a **permitted activity** under Rule 53 of the RFWP.

Activity	Commentary
The discharge / spraying of aquatic herbicides along the margins of Lake Ratapiko to manage unwanted aquatic plants	The discharge / spraying of aquatic herbicides is a **permitted activity** under Rule 32 of the RFWP.
The take of up to 7,787 l/s of water from Lake Ratapiko for hydro-electricity generation purposes	As the rate of water abstraction will be greater than permitted 1.5 l/s, the taking of water from Lake Ratapiko is a **discretionary activity** under Rule 16 of the RFWP.
The use and maintenance of an existing intake structure in the bed of Lake Ratapiko	The use of the existing intake structure in the bed of Lake Ratapiko will be a **permitted activity** under Rule 52 of the RFWP. The maintenance of the existing intake structure in the bed of Lake Ratapiko will be a **permitted activity** under Rule 53 of the RFWP.
Makara Stream	
The discharge of up to 2,000 l/s of water from an existing surge chamber during maintenance periods to an unnamed tributary of the Makara Stream	Given that the discharge may cause the disturbance of the bed of the unnamed tributary of the Makara Stream, the discharge of water and contaminants into the stream is a **discretionary activity** under Rule 43 of the RFWP.
The discharge of water from the Motukawa Power Station to the Makara Stream	Given that the discharge may cause the disturbance of the bed of the Makara Stream, the discharge of water and contaminants into the stream is a **discretionary activity** under Rule 43 of the RFWP.

Based on the above, the overall status of the resource consents being sought from the TRC is a **discretionary activity**.

4.2 CONSENT DURATION

Given the need for investment certainty associated with the continued operation and maintenance of the Motukawa HEPS, Trustpower consider that a 35 year consent duration is appropriate for the resource consent applications being sought for the Scheme. The reasoning for this is as follows:

- It is apparent from the annual monitoring surveys conducted by the TRC that there has been a high level of environmental compliance by Trustpower;
- It is apparent from the technical assessments that the environmental effects of the Motukawa HEPS are well known and understood;
- The proposed operating regime for the Motukawa HEPS will safeguard the health and wellbeing of the Manganui River and Waitara River, such that the sustainable management of natural and physical resources will be sustainably managed;
- It is not conceivable that the Motukawa HEPS will not continue to operate in some form in the short to medium term;
- The investment value of the Motukawa HEPS is approximately $12 million, and offers a wide range of benefits at a regional and local level; and
- Whilst it is recognised that the national policy framework regarding freshwater has been subject to recent change (and has changed multiple times in the last ten years) and that the TRC is required to undertake catchment scale planning for the management for freshwater, the technical assessments commissioned in preparing this AEE provided an assessment of the values of the Manganui River catchment and the flows necessary to prioritise the health and well-being of the waterbodies.

5. ASSESSMENT OF ENVIRONMENTAL EFFECTS

5.1 INTRODUCTION

This section of the AEE addresses the actual and potential effects associated with the continued operation and maintenance of the Motukawa HEPS.

The assessments consider the integrated management of the damming, diversion, take, use and discharge of water within various waterbodies affected by the Motukawa HEPS, including the Manganui River, the Motukawa Race, the Mangaotea Stream, Lake Ratapiko, the Mako Stream and the Makara Stream (as well as the use and maintenance of various structures related to the Scheme).

A number of technical assessments have been prepared to inform this AEE. These technical assessments are referenced, as appropriate, in sections 5.2 to 5.13 below.

Of particular relevance to the assessment of environmental effects are the provisions of the NPSFM which relate to the loss of river extent and values. In this regard, Clause 3.24 of the NPSFM specifies that every regional council must include the following policy (or words to the same effect) in its regional plan:

> *"The loss of river extent and values is avoided, unless the Council is satisfied:*
>
> *(a) that 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."*

This policy is adopted in NPS Policy 5A.4 of the RFWP.

With regard to clause (a), it is considered that there is a functional need for the existing structures and activities to occur in the Manganui River, Mako Stream and Makara Stream. In this regard, hydro-electricity generation inherently requires the placement of structures in the bed of rivers and the associated take, use, damming, diversion and discharge of water in order to operate. This is acknowledged in Policy C1 of the National Policy Statement on Renewable Electricity Generation ("**NPSREG**"), which requires decision-makers to have particular regard to the need to locate the renewable electricity generation activity where the renewable energy resource is available.

With regard to clause (b), Trustpower has held various workshops with its technical consultants in order to assess the actual and potential effects of the Motukawa HEPS on river extent and values in accordance with the effects management hierarchy set out in the NPSFM.[14] This approach has been adopted given that each step in the hierarchy requires consideration of what is 'practicable' or 'possible'.

[14] As defined in section 3.2.1 of the NPSFM.

What is 'practicable' is highly dependent on the facts of each case. It is context specific and involves examining, amongst other things, the following:

- The nature of the activity and its effects;
- The sensitivity of the environment to adverse effects;
- The likelihood of the adverse effects occurring;
- The financial implications of the options;
- The current state of knowledge of the activity and the availability of suitable ways to manage those effects; and
- The likelihood of success of the option.

The outcomes of the workshops held in order to assess the actual and potential effects of the Motukawa HEPS on loss of river extent and values are detailed in the Effects Management Hierarchy Table provided as **Appendix L** to this AEE. Rather than repeating the information provided in the Effects Management Hierarchy Table, the technical reports appended to this AEE (as summarised in the sections below), outline the conclusions reached when managing the effects of the Motukawa HEPS in accordance with the effects management hierarchy.

In summary, sections 5.2 to 5.13 below address the following matters:

Section 5.2 Positive Effects;

Section 5.3 Hydrology Effects;

Section 5.4 Fish Passage and Fish Screening Effects;

Section 5.5 Aquatic Ecology Effects;

Section 5.6 Operation of the Motukawa Race;

Section 5.7 Terrestrial Ecology Effects;

Section 5.8 Sedimentation Effects;

Section 5.9 Natural Character Effects;

Section 5.10 Landscape and Visual Amenity Effects;

Section 5.11 Recreation Effects;

Section 5.12 Dam Safety Effects; and

Section 5.13 Cultural Values.

5.2 POSITIVE EFFECTS

The benefits provided by the Motukawa HEPS contribute to local, regional, and national communities.

The Motukawa HEPS is an established and reliable generator of renewable electricity in the Taranaki Region. The approximately 22 GWh of electricity generated by the Scheme per annum is embedded in the local supply network, and the continued operation of the Scheme would enable these benefits to be maintained.

The Scheme's utilisation of water diverted from the Manganui River for the sustainable generation of electricity positively contributes to New Zealand's renewable energy productivity, and the continued operation of the Motukawa HEPS would ensure that Trustpower can maintain their support of the Government's national strategic target to generate 90% of electricity from renewable energy sources by 2025 (noting that the Labour Party has indicated a goal of achieving 100% renewable energy by 2030).

The operation and maintenance of the Motukawa HEPS also provides economic benefit through the provision of local employment, assisting security of supply, and by way of minimising costs associated with obtaining electricity from outside the.

The ability to realise these beneficial outcomes is reliant on the flexibility afforded through the operating conditions for the Motukawa HEPS. The embedded nature of the Scheme within the local supply network means that renewable energy generation is available to be placed into the local demand centre. This has the benefit of reducing losses associated with transmission and therefore makes the delivery of renewable energy from the Motukawa HEPS more efficient.

Lake Ratapiko, which was created for water storage purposes for the Motukawa HEPS, offers additional recreational benefit to the local community, facilitating a number of water sport activities, notably jet boating and water skiing. Overtime, the lake has accumulated lakeside vegetation and habitats for terrestrial and aquatic fauna (as detailed previously in section 2 of this AEE).

For the reasons detailed above, it is considered that consent for the continued operation and maintenance of the Motukawa HEPS will ensure that the positive effects provided by the Scheme can be maintained in a manner that will be beneficial for the wellbeing of the Taranaki Region.

5.3 HYDROLOGY EFFECTS

As detailed in the Hydrology Assessment by Tonkin & Taylor, the hydrological operation of the Motukawa HEPS will remain predominantly unchanged - with the exception of the cessation of water abstraction from the Mangaotea Stream. The historical take from the Mangaotea Stream has been relatively minor, contributing less than 1% of the of the total

inflow volume to Lake Ratapiko and thus the cessation of this take would not result in discernible hydrological changes within the catchment.

Tonkin & Taylor note that natural variability in the climate will impact the behaviour of the Motukawa HEPS and its effects on the flow regime of the Manganui River and Waitara River. In this regard, the future climate in the Taranaki Region by 2040 is predicted to:

- Be warmer by approximately 0.9˚C;
- Have a higher rainfall of approximately 5%;
- Have an increase in droughts;
- Have double the average number of both 'hot days' and 'dry days'; and
- Have a decreased average number of 'cold nights'.

An increase in temperature has the potential to reduce catchment runoff and river flows (particularly over the summer and autumn seasons), and an increase in 'hot days' and 'dry days' is likely to further reduce and prolong summer low flows. However, Tonkin & Taylor note that this flow reduction is likely to be offset by an increase in mean flows in winter and peak flow discharges as a result of the projected increase in mean rainfall. As a result of these changes, it is likely that there will be alterations to the flows of the Manganui River and therefore the volume of inflows into Lake Ratapiko.

Tonkin & Taylor acknowledges that the following operational matters of the Scheme have the potential to generate consequential effects on a range of environmental and socio-economic values:

- Local drainage, including flows captured by the Motukawa Race and Lake Ratapiko, and flows diverted from the Mako Stream; and
- Diurnal lake level fluctuations.

Tonkin & Taylor conclude that these hydrological changes, and those associated with climate change in the region, are not expected to be great enough to significantly affect the current operating regime of the Motukawa HEPS.

5.4 FISH PASSAGE AND FISH SCREENING EFFECTS

A summary of the fish passage and fish screening effects is provided in the sub-sections below and is based on the Aquatic Ecology Assessment by Ryder Environmental.

5.4.1 Manganui River

As detailed in section 2 of this AEE, the diversion weir on the Manganui River comprises a concrete weir across the full width of the river with fish passes either side. Ryder considers these fish passes to be effective at providing upstream fish passage for all species (with the possible exception of torrentfish). Furthermore, the proposed

continuation of a 5.2 m^3/s take from the Manganui River will not compromise the current 400 l/s residual flow requirement downstream of the diversion weir, or the effectiveness of the fish passes.

An electrical field device is currently operating on the trash screen installed at the intake to the Motukawa Race to help deter fish from entering the race.

5.4.2 Motukawa Race

As detailed previously in section 2 of this AEE, a set of sluice gates located approximately 80 m along the Motukawa Race generally remain shut, but do not currently seal tight, and leak water into a return channel that is connected to the Manganui River - providing an attractant flow of water for fish. The installation of a barrier on the vertical wall at the channel's outlet to the Manganui River, in accordance with the recommendations provided by Ryder Environmental, will restrict elvers and other species making their way into the return channel.

No changes are proposed to the in-race generator infrastructure within the Motukawa Race and therefore, when operating, the effect of fish reaching the in-race generator trash screen and passing through the turbine blades will be the same as the current situation. However, as detailed in section 3 of this AEE, Trustpower proposes to implement a trap and transfer programme within the Motukawa Race to assist with reducing the risk of fish making their way along the race and being impacted by the in-race generator.

5.4.3 Lake Ratapiko and Mako Stream

Fish enter Lake Ratapiko via the Motukawa Race, or via the elver pass located at the Ratapiko Dam service spillway. While some fish species may be able to thrive in the lake for variable lengths of time (e.g. eel and trout), it is possible that other fish species with downstream migratory requirements (e.g. adult eel, giant and shortjaw kokopu, larvae of bully and koaro, and juvenile lamprey) may find their way down to the Motukawa Power Station intake in the eastern arm of the lake. The trash screen installed at the intake, and the low water velocities in front of the intake structure, provide some deterrent to the impingement of adult eel and other adult / larger fish species on the screen. However, these factors are less likely to prevent larvae and small fish from entering the intake / tunnel.

For those fish that make their way through the intake trash screen, Ryder Environmental predicts that subsequent passage through the Motukawa Power Station will result in mortality for some fish, with fish over 20 cm in length having a predicted mortality of at least 50%, and fish of approximately 10 cm in length having a predicted mortality of 36% or less. The species at greatest risk are downstream migrating adult longfin and shortfin eels due to their long length, with mortality anticipated to be over 90%. With respect to other

species that may be drawn into the Motukawa Power Station, smaller fish fair better and are more likely to survive passage through the turbines.

The existing trap and transfer programme that occurs around the Motukawa Power Station intake, and the existing elver trap at the power station operate effectively with regard to relocating fish away from the Motukawa Power Station (to either the Manganui River upstream of the diversion weir, or into Lake Ratapiko). The operation of this trap and transfer programme will continue and be enhanced.

The existing elver pass located adjacent to the Ratapiko Dam service spillway operates sufficiently to enable passage between the Mako Stream and Lake Ratapiko. The operation of this fish pass will continue.

5.4.4 Mitigation Measures

Ryder Environmental recommends that in order to strengthen the fish passage provisions of the Motukawa HEPS and minimise the possibility of fish mortality, the following measures should be undertaken:

- The existing fish pass on the true right bank of the diversion weir in the Manganui River should be maintained to address erosion of banks and drop structures that may impede fish passage (notably torrentfish);
- A barrier should be installed on the vertical wall of the sluice gate's return channel outlet to the Manganui River to prevent upstream access (and the subsequent trapping) of climbing species in the return channel;
- The existing upstream and downstream trap and transfer programmes that operate in Lake Ratapiko and the tailrace of the Motukawa Power Station should be enhanced. This includes introducing a fyke-net trapping programme around the edges of the lake to assist in reducing the potential number of adult fish that migrate down towards the Motukawa Power Station intake; and
- A trap and transfer programme should be undertaken in the Motukawa Race multiple times a year to transfer adult eels out of the race system before they encounter the in-race generator and / or make their way to Lake Ratapiko.

5.5 AQUATIC ECOLOGY EFFECTS

The Aquatic Ecology Assessment by Ryder Environmental assesses the effects of the Motukawa HEPS on the aquatic ecology of the Manganui River, Lake Ratapiko and the Makara Stream.

5.5.1.1 Effects on Water Temperature

Ryder Environmental identifies that during summer water temperatures in the Manganui River downstream of the intake are generally higher than upstream, and can exceed the thermal tolerance criteria for brown trout.

Although very high water temperatures can be detrimental, warm water temperature can also increase productivity in aquatic communities. Fish are also able to respond to water temperatures above their thermal preferences by temporarily moving to cooler locations (e.g. where a tributary or groundwater inflow enters).

To ensure that water temperatures in the Manganui River downstream of the intake do not remain at very high temperatures for an extended period, Ryder Environmental recommends a higher residual flow be implemented in the event that water temperature at a site located approximately 2.3 km downstream of the intake exceeds 25 ˚C (based on a one hour rolling average).

The degree of modification to the residual flow regime necessary to achieve a temperature reduction downstream would be determined based on a monitoring trial undertaken during a period of warm water temperature (i.e. January / February 2022).

Ryder Environmental considers the implementation of this minimisation measure will ensure that the adverse effects from the proposed abstraction of water from the Manganui River on water temperatures downstream are no more than minor.

5.5.1.2 Effects on Nuisance Algae Growth

Proliferations of long filamentous nuisance algae growth rarely occur downstream of the intake under the existing operating conditions.

However, in order to mitigate any nuisance growths of periphyton within the Manganui River, Ryder Environmental has recommended that a flushing flow regime be implemented during summer when the flow downstream of the take has not exceeded 13.3 m^3/s (i.e. three times the median flow) for 30 days. Furthermore, the water take from the Manganui River will be reduced for six hours during the next fresh event to allow a flushing flow of at least 13.3 m^3/s to pass downstream.

The implementation of the flushing flow regime in conjunction with the proposed temporary reduction in take if water temperatures downstream exceed 25 °C (as discussed above) will ensure that potential risk of nuisance algae growths occurring will be no more than minor.

5.5.1.3 Effect on Macroinvertebrate Community Health

High summer water temperatures can impact macroinvertebrate community health. This is apparent at sites in the middle and lower reaches of rivers in the Taranaki Region, which

have lower macroinvertebrate health during summer than in spring. This difference has been related to summer warmer water temperatures, increased periphyton cover, and lower flows.

Macroinvertebrate community health has generally been higher within the upstream reaches, with macroinvertebrate community metrics at the SH3 site on the Manganui River being indicative of the highest quality habitat ('excellent') and lowest at the Bristol Road site ('fair-poor') in its lower reaches. The differences being indicative of land-use intensity which increases downstream in the catchment. However, water temperatures and nuisance algae proliferations that can occur during summer have been found to impact on macroinvertebrate communities at both upstream and downstream monitoring sites.

As such, the proposed temporary reduction in take if water temperatures downstream of the intake exceed 25 °C, and the implementation of a flushing flow regime following long periods of low flow downstream of the intake will ensure that the potential risk of adverse effects on macroinvertebrate community health will be no more than minor.

5.5.1.4 Effects on Fish Habitat

Ryder Environmental notes that the amount of habitat available for fish species depends on the individual habitat requirements of each species. For some species the amount of habitat increases as flows increase (e.g. adult brown trout and torrentfish), and for others it deceases (e.g. inanga feeding and redfin bully).

For most native fish species there is an increase in the amount of available habitat under the flow regime relative to natural low flow conditions. This includes Cran's bully, inanga feeding, lamprey, shortjaw kokopu, redfin bully and small shortfin eels (less than 300 mm) - which are predicted to have increases in habitat ranging from 15 to 54%.

For other species there is a moderate decline in habitat (noting that these predictions represent a somewhat worst-case scenario). This includes:

- Large shortfin eels (greater than 300 mm) and small longfin eels (less than 300 mm), ranging from 18 to 26%;
- Torrentfish with a decline of 79%, as they prefer high water velocities; and
- Brown trout and food resources with declines ranging from 36-70%.

Furthermore, and despite the modelled changes to habitat identified above, recent fish community surveys undertaken downstream of the weir by the TRC in June 2018 confirmed that Cran's and redfin bullies, longfin and shortfin eels, and torrentfish are all present within 1.7 km downstream of the diversion weir. Lamprey, longfin and shortfin eels, redfin bullies, inanga, koaro, shortjaw kokopu, and brown trout have all been identified in the diversion weir fish pass and/or upstream of the diversion weir, indicating that the existing fish passage provided is effective.

Ryder Environmental recommend that, as with the existing conditions, a requirement for artificial freshes is maintained. However, they recommend an amendment from the existing passing of 400 l/s over the weir if not occurring naturally, to a flushing flow of at least 13.3 m^3/s if flow downstream of the weir has not exceeded 13.3 m^3/s for 30 days (refer to section 5.5.1.2 of this AEE). It is likely that flushing flows such as these contribute to encouraging upstream migration for some native fish species.

5.5.2 Lake Ratapiko

Ryder Environmental acknowledges the development of ecosystem services within Lake Ratapiko overtime, and the lake's current support of a native fish community and a trout fishery. Ryder Environmental note that it is not possible to avoid temporary losses of habitat for some species resulting from the fluctuating lake level, and that the lowering of the lake level for maintenance purposes results in temporary habitat loss for some aquatic species within the lake.

In order to avoid or minimise the risk of fish stranding, the existing consent conditions require that when the lake level is drawn down for maintenance that it occurs gradually over a 7-day period. Ryder Environmental recommends that this measure is maintained, ensuring that the potential risk of adverse effects on the existing aquatic community resulting from the operation of Lake Ratapiko, will be no more than minor.

5.5.3 Makara Stream Downstream of the Tailrace

When the Motukawa Power Station is operating, nitrogen and phosphorus levels are elevated in the Makara Stream - although they remain well within relevant bottom lines under the NPSFM and the levels will further dissipate as the water moves further downstream.

Water temperatures in the Makara Stream typically remain within the range of thermal preferences for the fish species present (i.e. common / Cran's bullies and eels). Dissolved oxygen concentrations in the Makara Stream are reduced at times, however, are still well within the bottom lines of the NPSFM.

Overall, Ryder Environmental consider that the risk of adverse effects on water quality in the Makara Stream as a result of the continued discharge of water from the Motukawa HEPS will be no more than minor.

5.6 OPERATION OF THE MOTUKAWA RACE

The Hydraulic and Geotechnical Assessment by Riley Consultants assesses the performance of the Motukawa Race against the proposed continued operation of the Scheme.

Riley Consultants conclude that:

- Ongoing slumping and erosion are evident within the Motukawa Race. Effective remedial works have been undertaken by Trustpower using an observational approach to issues, and that this should continue. . Remedial measures should continue to be employed in this regard; and
- Significant inflows into the Motukawa Race from the local catchment occur during flood events. Closure of the intake structure is necessary in flood events at or above a Mean Annual Event. This will leave the race to act more as a drain to reduce the impact of local flooding. During smaller flood events, modulation of the intake gates should continue, as is current practice, to manage race water levels.

5.7 TERRESTRIAL ECOLOGY EFFECTS

The potential effects of the proposed continued operation and maintenance of the Motukawa HEPS on terrestrial ecology have been assessed in the Terrestrial Ecology Assessment by Ryder Environmental and are discussed in the sub-sections below.

5.7.1 Motukawa HEPS Infrastructure

When the Motukawa HEPS was constructed, areas of terrestrial vegetation and habitat for terrestrial fauna were removed in order to enable the construction of the various structures and infrastructure of the Scheme. Ryder Environmental consider that as any effects associated with the ongoing presence of these structures are small and localised, and have negligible effect on terrestrial ecological values. It is also noted that based on the areas of vegetation and habitat adjacent to the structures, if the structures did not exist, the vegetation would not have high ecological value.

Taking the above into consideration and acknowledging the establishment of Lake Ratapiko for water storage purposes and the positive terrestrial ecological values associated with the lake (i.e. lakeside vegetation and habitat for terrestrial fauna), the creation of Lake Ratapiko has generated a net positive effect on terrestrial ecological values in the area.

5.7.2 Manganui River

No changes are proposed to the existing flows of the Manganui River, and as such with the ongoing operation and maintenance of the Motukawa HEPS there will be no change in effect on bird communities along the Manganui River, noting also that there is an abundance of foraging opportunities in the wider landscape for these communities.

While located in close proximity to the water, the significant vegetation located within the vicinity of the Motukawa HEPS (and identified in section 2 of this AEE) are essentially located within terrestrial ecosystems and are not in areas affected by the flow of the Manganui (and Waitara) Rivers. As such, these areas are entirely or almost entirely unaffected by any river flow changes.

5.7.3 Motukawa Race

There will be no changes to the existing water levels and velocities in the Motukawa Race. As such, the ongoing operation and maintenance of the Motukawa HEPS will have no ecological effect on the flora and fauna of the riparian margins of the race.

5.7.4 Lake Ratapiko and the Mako Stream

The formation of Lake Ratapiko resulted in the inundation of 21 ha of farmland, and the establishment of the same area of aquatic habitat. As indicated above, the creation of Lake Ratapiko has likely resulted in a net positive effect on terrestrial ecological values, through the development of lakeside vegetation and habitat for terrestrial fauna including waterbirds.

Flows within the Mako Stream would have reduced as a result of the damming of the stream to form Lake Ratapiko. The banks of the Mako Stream are steep and generally not suitable for pasture, and therefore have been largely unaffected by changes in flow in the stream. The proposed continued operation of the Motukawa HEPS will result in no changes to the ecological values associated with the stream.

5.7.5 Makara Stream

Flows within the Makara Stream vary depending on electricity demand and water discharge from the Motukawa Power Station. The stream margins support a diversity of riparian vegetation that also provide habitat for introduced and indigenous fauna.

In the absence of the Motukawa HEPS, the Makara Stream would likely have a more stable flow. However, Ryder Environmental considers that effects of the Motukawa HEPS operation are of little ecological consequence given the small interface between the stream and riparian vegetation, and terrestrial ecological values are unlikely to be impacted by variable flows within the Makara Stream.

5.7.6 Waitara River

The operation of the Motukawa Power Station results in diurnal variation in generation flow and thus downstream changes in flow and river level in the Waitara River. Ryder Environmental indicates that operation of the Motukawa HEPS has likely influenced the type and extent of vegetation in the immediate vicinity of the water's edge along the river, however, any such effects are likely to be very small in extent and of no consequence to the riparian ecological communities. This is due to natural flow variation being far greater that the variation resulting from the Motukawa Power Station operation, and because most riparian vegetation is located up steep banks and well-above the immediate water's edge.

5.8 SEDIMENTATION EFFECTS

The Sediment Assessment by Tonkin & Taylor assesses how sedimentation processes within the environment will be impacted as part of the reconsenting of the Motukawa HEPS.

Suspended sediment in the Manganui River, Motukawa Race, Lake Ratapiko and Mako Stream originates almost entirely from the underlying geology and surface soils, with land-cover, river behaviour and flow dynamics all influencing the volume and concentration of fine-grain sediment held in suspension.

In terms of the Manganui River, Tonkin & Taylor estimate that suspended sediment entrained into the Motukawa Race is approximately 6% of the overall suspended load in the Manganui River at the diversion weir, leaving 94% of the 'natural' suspended sediment load to continue downstream of the diversion weir. This indicates that there is a disproportionate reduction in flow volume compared to sediment loads downstream of the diversion weir. Furthermore, Tonkin & Taylor considers that the character and behaviour of the Manganui River is similar to conditions that would have existed prior to the diversion weir's construction - indicating the Motukawa HEPS has minimal sedimentation effects on the downstream reaches of the Manganui River.

The largest contribution to sediment loads within Lake Ratapiko is from the Motukawa Race. Under current operating conditions, the annual sediment load entering the race from the Manganui River is estimated to be approximately 805 tonnes per year. Tonkin & Taylor has assessed that the Silt Pond is highly effective at trapping sediment, with an estimated efficiency of 90.

In terms of sedimentation effects within Lake Ratapiko, the assessment by Tonkin & Taylor has split the lake into two 'arms' - with the western arm receiving flows (and sediment) from the Motukawa Race and the eastern arm from the Mako Stream. Tonkin & Taylor indicates that most sediment accumulation within Lake Ratapiko is within the western arm, being associated with the flow carried by the Motukawa Race. The remaining contribution of sediment is mostly attributed to the Mako Stream.

Tonkin & Taylor, through comparative bathymetric surveys, has observed a small annual volumetric change in the lake mostly in the western arm. Tonkin & Taylor determined this by abstracting sediment cores from Lake Ratapiko to determine the depth of deposited material within the lake. Results of this suggest that there was between 0.05 – 0.2 m of sediment deposited since the construction of the lake, with the greatest amount of deposition occurring in the western arm. Trustpower does not anticipate any associated storage or operation issues during the prospective term of these resource consents. Overall, sedimentation effects within the lake have been assessed to be very low.

With regard to the water diverted from Lake Ratapiko to the Motukawa Power Station (which is subsequently discharged to the Makara Stream and the Waitara River), Tonkin &

Taylor has assessed that under both the current and future proposed operating conditions the discharged water will be clear water, meaning this water is without sediment and thus would not affect sedimentation loads within the receiving environment.

5.9 NATURAL CHARACTER EFFECTS

Natural character values in the vicinity of the Motukawa HEPS have previously been reduced as a result of changes to the flow regime, morphology, vegetation and habitat of the Manganui River, Waitara River, and their tributaries. While a short section of the Manganui River (associated with the diversion weir, intake structure, and reduced water flow) and the Mako Stream (associated with the damming and periodic water flow in the upper reaches of the stream) are highly modified as a result of the Scheme, the majority of the rivers and stream reaches associated with the Motukawa HEPS have constant water flows and limited modification.

In summary, the continued operation of the Motukawa HEPS will:

- Have no effect on the natural character values of the reach of the Manganui River running from Egmont National Park through to Tariki Road South;
- Have moderate to low adverse effects on the natural character values of the 20 km reach of the Manganui River from Tariki South Road to Waitara River;
- Have low adverse effects on the natural character values of the Mangaotea Stream as a result of the Mangaotea Aqueduct;
- Have moderate to low adverse effects on the natural character values of the Mako Stream from Lake Ratapiko to Makino Stream;
- Have very low adverse ongoing effects on the Waitara River between the confluences with the Makara Stream and Makino Stream, with no changes to flow or natural character values further upstream;
- Have low adverse effects on the natural character values of the reach of the Makara Stream to the Waitara River;
- Have very low adverse effects on the natural character values of the Waitara River from the Makara Stream to the Manganui River; and
- Have no effect on the natural character values of the reach of the Waitara River running from the Manganui River to the Tasman Sea.

Overall, when considering the Manganui River and its tributaries as a whole, the adverse effects on the existing natural character values are considered to be low (or less than minor).

Within the Waitara River catchment, adverse effects on the natural character values of the Mako Stream are considered to be moderate-low (minor), however the overall adverse

effects on the other streams and the Waitara River are considered to be low (or less than minor).

5.10 LANDSCAPE AND VISUAL AMENITY EFFECTS

As detailed in the Natural Character, Landscape and Visual Assessment, most of the various components of Scheme have been in place for over 90 years and have become a recognised part of the local landscape. Further, the landscape effects currently associated with the physical structures as part of the Motukawa HEPS will not change (with the exception of the removal of the Mangaotea Pumps).

In summary, Boffa Miskell concludes that:

- The diversion weir and associated structures are well established in the locality, are recognised as part of the landscape, and are only publicly viewable from a limited number of locations. ;
- The Motukawa Race is a linear element with numerous structures traversing its length, which are well established and integrated into the surrounding rural landscape. Aside from the removal of the Mangaotea Pumps, all components of the race will continue to operate as they currently do. Any adverse landscape and visual amenity effects associated with the continued operation of the Motukawa Race are considered to be very low (less than minor);
- Lake Ratapiko and the structures located within the lake are well established and an integrated part of the surrounding landscape, with the lake being recognised for its recreational and amenity values. The visual daily changes to the lake levels are a recognised fluctuation, much like a tidal variation. The continued operation and maintenance of the Scheme will not change the landscape qualities and character of the lake, and the lake will continue to be enjoyed by recreational users. Furthermore, it is noted that the lake has enhanced the visual amenity of the surrounding rural farmland, resulting in moderate beneficial landscape character effects and enhanced amenity for lake users and residents of the area; and
- The Motukawa Power Station, penstocks and tailrace have become an established part of the landscape character of the rural landscape set within the foothills of the Waitara River. As the surrounding landscape is modified, the structures of the Scheme do not alter the rural character of the area to any more than a limited extent. The Motukawa Power Station and associated buildings are now well integrated into the immediate site surrounds with vegetation screening them from the road and surrounding farms and dwellings. As such, the Motukawa Power Station and associated structures result in no more than low (less than minor) adverse effects on landscape character and visual amenity.

Overall, it is considered that the landscape elements and ongoing effects of the Motukawa HEPS are considered to be less than minor, with any adverse effects of the in-stream,

Motukawa Power Station and lake structures compensated for by the landscape quality and character of the lake and its wide public use and enjoyment.

5.11 RECREATION EFFECTS

The Recreation Assessment involved an extensive literature review of recreational values and uses of areas located within the vicinity of the Motukawa HEPS, as well as interviewing and correspondence with key recreational users within the vicinity in order to obtain an understanding of users' perceptions of the quality and nature of the recreational experience within the vicinity of the Scheme.

Rob Greenaway & Associates advise that recreational values associated with the Manganui River lie predominantly upstream of the diversion weir (angling) and downstream of Everett Park (swimming, kayaking and rafting), with whitebaiting also occurring in the lower Waitara River.

Lake Ratapiko is also identified as being a significant regional recreation setting, with benefit having resulted from the creation and operation of the Scheme by way of the swimming, water skiing, jet boating, fishing, hunting and other recreation activities that take place in the lake.

When considering the current operation of the Scheme, Rob Greenaway & Associates provided the following conclusions in relation to effects on recreational values resulting from the continued operation and maintenance of the Motukawa HEPS:

- Effects on fish species (that are recreationally fished) within freshwater environments within the vicinity of the Scheme (notably the Manganui River, both upstream and downstream of diversion weir, and the Waitara River) are considered to be no more than minor;
- To date, the Scheme has had no observable effect on kayaking or rafting amenity;
- Water quality in both Lake Ratapiko and at Everett Park (on the Manganui River) have been assessed by the TRC as suitable for contact recreation;
- There will be no change to the capacity of the Motukawa Power Station to discharge water, and as such effects on jetboating within the Waitara River will be less than minor; and
- Effects on recreation activities within Lake Ratapiko will remain less than minor.

Overall, Rob Greenway & Associates consider that the operation of the Motukawa HEPS will maintain in-river recreation values in the waterways of the catchment, enhance them via the provision of Lake Ratapiko, and minimise effects on trout and whitebait via the existing fish passes and proposed mitigation and remediation measures for fish species.

5.12 DAM SAFETY EFFECTS

Trustpower dams are managed in accordance with the NZSOLD Guidelines and the Trustpower Dam Safety Policy and Dam Safety Management System ("**DSMS**").

In 2015, the NZSOLD Guidelines were amended, and the Trustpower Dam Safety Policy and DSMS were updated accordingly.

The Dam Safety Policy outlines Trustpower's approach to dam safety and the implementation of the DSMS.

Trustpower's DSMS (prepared in November 2019) predominantly aligns with the dam safety management system set out in Module 5 of the NZSOLD Guidelines. As part of the DSMS, Riley Consultants carry out routine monitoring and surveillance on Trustpower dam sites, identifying any dam safety recommendations or inconsistencies with the NZSOLD Guidelines. Implementation of any necessary changes / improvements are then carried out by either the production team of the effected dam, or Trustpower's Dam Safety & Water Resources Team. All dam safety issues are identified, recorded, managed and tracked on a comprehensive Dam Safety Deficiency Management Program.

Each of Trustpower's schemes has a unique monitoring and surveillance network. Routine reviews of the networks take place, with the Motukawa HEPS network reviewed every ten years. The next review of the Scheme is scheduled for 2027.

The NZSOLD Dam Safety Risk Management Process stipulates that upon identification of any elements that no longer meet the NZSOLD Guidelines, dam owners are to undertake an assessment of potential risk treatment options that are available to assist with realigning a dam with the NZSOLD Guidelines, prior to implementing any improvements / changes.

If the 2027 review identifies any elements of the Ratapiko Dam that no longer meet the NZSOLD Guidelines, Trustpower will undertake an assessment of potential risk treatment options, so to determine the most suitable risk reduction measures for realigning the safety of the Ratapiko Dam with the NZSOLD Guidelines.

As demonstrated by the processes described above, the dam safety of the Motukawa HEPS is, and will continue to be suitably managed by Trustpower, in accordance with the NZSOLD Dam Safety Guidelines.

5.13 CULTURAL VALUES

Trustpower understands that it is for the relevant iwi and hapu to describe any cultural or historical associations with the Manganui River and Waitara River, and as detailed further in section 6 of this AEE, further information on these associations is intended to be provided as part of the cultural values assessment.

However, based on the consultation undertaken by Trustpower to date, it is understood that some of the potential matters of interest to iwi and hapu include:

- Changes to the statutory planning framework in the NPSFM and its implications for the resource consent applications by Trustpower;
- The process by which the cultural values of the Manganui River might be identified;
- The duration of the resource consents that are being sought by Trustpower;
- The hydrological effects of the operation of the Motukawa HEPS, and the potential for further changes due to climate change;
- Fish passage along the Manganui River and Mako Stream;
- Screening of intake structures and the survivability of native fish going through the penstocks / turbines;
- The effectiveness of the existing upstream and downstream trap and transfer programmes and ways for improvement;
- Discovery of two juvenile lamprey in the Silt Pond during maintenance activities and the resulting monitoring programme by NIWA;
- Decommissioning of the Mangaotea Pumps and the effects the removal of structures may have on the riverbed;
- Habitat of the bed of Lake Ratapiko;
- Recreational uses of Lake Ratapiko and awa;
- The availability of habitat and quality of water in the Manganui River downstream of the diversion weir, and in the Mako Stream;
- The protection of mahinga kai sites; and
- The possibility for decreasing the take and / or increasing flows to improve the habitat in the Manganui River downstream of the diversion weir.

5.14 CONCLUSION

This section of the AEE has been informed by a number of comprehensive technical assessments commissioned by Trustpower to assess the potential environmental effects associated with the continued operation and maintenance of the Motukawa HEPS.

Overall, and based on the technical assessments that have been prepared, it is considered that the continued operation and maintenance of the Motukawa HEPS will appropriately avoid, remedy or mitigate potential adverse effects on the environment.

A number of measures that have been identified within this section for avoiding, remedying or mitigating adverse effects are also reflected in the proposed resource consent conditions proffered by Trustpower as part of this AEE.

6. CONSULTATION

6.1 INTRODUCTION

This section provides an overview of the consultation that has been undertaken by Trustpower with key stakeholders in the preparation of this AEE.

6.2 CONSULTATION WITH IWI AND HAPU

Trustpower commenced engagement with the iwi and hapu who have interests in the Manganui River and Waitara River in 2018, as part of initiating consultation for the reconsenting of the Mangorei and Motukawa HEPS. In this regard, a number of the iwi and hapu interests are the same or overlap for both projects.

Site visits and individual hui were initially held with iwi and hapu representatives to best determine a way forward for engagement during the resource consenting process for the continued operation of both the Mangorei and Motukawa HEPS.

6.2.1 Engagement

The early engagement undertaken by Trustpower ultimately resulted in the formulation of an iwi forum, which includes representation from the following iwi and hapu:

- Te Kotahitanga o Te Atiawa Trust;
- Manukorihi hapū;
- Nga Mahanga a Tairi;
- Ngati Rahiri Hapū o Te Atiawa (Taranaki) Society Inc;
- Ngāti Tawhirikura hapū;
- Ngāti Te Whiti;
- Ngāti Maru;
- Ngāti Mutunga;
- Otaraua hapū;
- Pukerangiora hapū; and
- Puketapu hapū.

Although originally referred to as the 'Mangorei Forum', this group has evolved and is working to provide context around the iwi values and interests in relation to the reconsenting of the Mangorei and Motukawa HEPS.

It has been generally agreed at the forum hui that have taken place that the mana whenua for the areas in which the Motukawa HEPS is located are Ngāti Maru and Pukerangiora.

The function and purpose of the forum is to consider any technical and scientific information provided by Trustpower, be engaged to inform the preparation of a cultural values framework for the resource consent applications, and be engaged to inform the technical and scientific assessments commissioned by Trustpower from a cultural perspective.

An initial site visit with the representatives of the forum occurred in late 2018, and multiple hui focusing on the Motukawa HEPS took place during 2021. A two-day senior leadership forum and workshop with all of Trustpower's technical experts was planned to take place at the Pukerangiora Marae on 20 - 21 August 2021, but was unfortunately postponed due to COVID-19. Trustpower is working with the forum to reschedule a workshop in early 2022 when appropriate health and safety protocols can be confirmed.

Trustpower has provided initial presentations of the hydrological, aquatic ecology, and fish passage assessments for the reconsenting of the Motukawa HEPS to the forum. All experts were going to provide full technical presentations at the postponed workshop in August 2021, including aquatic ecology, fish passage / screening, sediment transport, landscape and natural character, recreation, terrestrial ecology and hydrology.

Key matters relating to the operation of the Motukawa HEPS raised during the various meetings and discussions between Trustpower and members of the forum are detailed in section 5 of this AEE. It is recognised that the listed matters in section 5 of this AEE reflect Trustpower's understanding of the matters raised by iwi and hapu to date, and that further matters may be identified during the preparation of the cultural values assessment.

The forum have advised that they intend to provide one joint cultural values assessment for the Motukawa HEPS.

6.2.2 Identification of Values

The Environmental Management Plan of Te Atiawa (Tai Whenua, Tai Tangata, Tai Ao) identifies key values and guiding principles which detail iwi requirements for environmental management within their rohe. These are documented in Table 7 below. It is Trustpower's intent to gain an understanding of these values at upcoming hui in 2022, and how the Scheme may affect them.

Table 7: Te Atiawa Guiding Values and Principles

Principle	Description
Whakapapa	Identity and where we came from
Kaitiakitanga	The environmental, spiritual and cultural guardianship role of iwi and the commitment of an operator to conduct environmentally sustainable operations.
Rangatiratanga	The right of iwi to exercise authority and self-determination of their turungawaewae
Kotahitanga	Unity so as to meet the same goal or common place
Manaakitanga	Mutual respect. Work together with fairness and integrity.
Mauri	A measure of understanding the health and wellness of a place or being. Central to Kaikitanga.
Wairuatanga	Understanding that spiritual and physical worlds are inherently intertwined. Also central to Kaiakitanga.

6.3 CONSULTATION WITH OTHER STAKEHOLDERS

Trustpower's engagement with other key stakeholders in relation to the reconsenting of the Motukawa HEPS has included:

- A site visit to the Motukawa HEPS in November 2019 for staff from the TRC, Fish & Game and the Department of Conservation in order to introduce the consenting process, provide familiarity regarding the operation of the Scheme for all stakeholders, and to develop an understanding of the key issues for stakeholders;
- Presentations of the hydrology and aquatic ecology technical assessments were provided to Fish & Game and the Department of Conservation in September 2021, with the authors of the key technical assessments also presenting to both parties;
- Fish & Game provided feedback on aspects of the technical assessments – with the focus being on:
  - The management of high temperatures in the Manganui River;
  - Modifying the fish passage on the true left of the diversion weir for easier accessibility for trout;
  - Understanding any recent mortality through the penstocks;

- Trapping and transfer intensification since 2009; and
- Effects on trout habitat during the annual lake drawdown for maintenance activities.

- The Department of Conservation did not provide any comments or ask any questions of significance;
- New Plymouth Water Ski Club ("**Water Ski Club**") – Trustpower has met with representatives of the Water Ski Club several times since 2019. Trustpower endeavours to continue to provide higher lake levels during the summer and on request during special event weekends for the Water Ski Club. The club are satisfied with these endeavours that Trustpower has provided over the last 20 years; and
- Jet Boating New Zealand Incorporated ("**Jet Boat Club**") – Trustpower has met with representatives of the Jet Boat Club several times since 2019. Trustpower endeavours to continue to provide higher lake levels during the summer and on request during special event weekends for the Jet Boat Club. The club are satisfied with this arrangement which has occurred for the last 20 years.

Trustpower has given consideration to the feedback provided by stakeholders and sought to develop operating conditions around (i) the provision of flushing flows in summer months when sustained low flows have occurred; and (ii) the inclusion of local iwi and hapu in the operating practices associated with any fish salvaging operations associated with the Motukawa HEPS.

7. STATUTORY CONSIDERATIONS

7.1 INTRODUCTION

The RMA is the principal statutory document governing the use of land, air and water. The purpose of the RMA, as set out in section 5 of the RMA, is to "*promote the sustainable management of natural and physical resources*". This section of the AEE sets out the framework under the RMA that applies to the resource consents that are being sought from the TRC - which are collectively classified as a discretionary activity.

7.2 SECTION 104 ASSESSMENT

7.2.1 Introduction

Section 104 of the RMA lists the matters that a consent authority must, subject to Part 2, have regard to in determining whether a resource consent application should be granted. It states:

> *(1) When considering an application for a resource consent and any submissions received, the consent authority must, subject to Part 2, have regard to–*
>
> *(a) any actual and potential effects on the environment of allowing the activity; and*
>
> *(ab) any measure proposed or agreed to by the applicant for the purpose of ensuring positive effects on the environment to offset or compensate for any adverse effects on the environment that will or may result from allowing the activity; and*
>
> *(b) any relevant provisions of—*
>
> *(i) a national environmental standard:*
>
> *(ii) other regulations:*
>
> *(iii) a national policy statement:*
>
> *(iv) a New Zealand coastal policy statement:*
>
> *(v) a regional policy statement or proposed regional policy statement:*
>
> *(vi) a plan or proposed plan; and*
>
> *(c) any other matter the consent authority considers relevant and reasonably necessary to determine the application.*
>
> *(2) When forming an opinion for the purposes of subsection (1)(a), a consent authority may disregard an adverse effect of the activity on the environment if a national environmental standard or the plan permits an activity with that effect.*
>
> *(2A) When considering an application affected by section 124 or 165ZH(1)(c), the consent authority must have regard to the value of the investment of the existing consent holder.*

Section 104 of the RMA does not give any of the matters to which a consent authority is required to have regard primacy over any other matter. All of the relevant matters are to

be given such weight as the consent authority sees fit in the circumstances and as directed by the relevant statutory planning documents. All of the provisions are subject to Part 2 of the RMA, although it is understood that a consent authority is not required to have recourse to Part 2 of the RMA unless broadly there is uncertainty, lack of complete coverage or a lack of competent preparation of the relevant statutory planning documents. This may be because the statutory planning documents are outdated, there are fundamental planning flaws demonstrating that a plan has not been prepared in a manner that reflects Part 2 of the RMA, or the statutory planning framework pulls in different directions.

The matters for consideration under section 104 of the RMA are assessed in the sub-sections below.

7.2.2 Actual and Potential Effects

With respect to section 104(1)(a) of the RMA, the actual and potential effects on the environment relating to the continued operation and maintenance of the Motukawa HEPS are set out in section 5 of this AEE and the relevant technical assessments.

Trustpower has given particular consideration to how the operation of the Motukawa HEPS can appropriately sustain the health and wellbeing of the Manganui River and other waterbodies. As noted in section 3 of this AEE, the company is proposing refinements to the management of the flow regime in the Manganui River during low flows or summer periods to ensure it is responsive to potential changes in environmental conditions. Trustpower is also proposing improvements to the trap and transfer programmes it undertakes throughout the Scheme. The various measures proposed by Trustpower are documented in the proposed conditions of consent.

Furthermore, and consistent with the focus on all actual and potential effects in section 104(1)(a) of the RMA, it is considered that the Motukawa HEPS will have demonstrable positive effects in terms of sustaining the social and economic wellbeing of the local / regional communities. In particular, the Motukawa HEPS contributes to security of electricity supply and the Government's strategic targets for the generation of renewable electricity and the decarbonisation of the New Zealand economy.

With respect to section 104(1)(ab) of the RMA and the requirement for a consent authority to consider any measure proposed by an applicant to ensure positive effects by offsetting or compensating for any adverse effects on the environment, it is noted that the conclusions reached with respect to actual and potential environmental effects of the continued operation of the Motukawa HEPS mean that no additional compensatory or offsetting measures are warranted or considered necessary by Trustpower.

7.2.3 Relevant Statutory Planning Documents

For the purpose of section 104(1)(b) of the RMA, the relevant statutory planning documents are considered to be:

- Freshwater NES;
- National Policy Statement for Renewable Electricity Generation 2011 ("**NPSREG**");
- NPSFM;
- RPS; and
- RFWP.

Each of these policy statements and plans are considered further in the sub-sections below. The objectives and policies of the RSP have not been considered in relation to the proposed removal of vegetation around the margins of Lake Ratapiko given the proposed vegetation removal is a permitted activity.

7.2.3.1 National Environmental Standards for Freshwater

The Freshwater NES came into effect on 3 September 2020.

The various regulations in the Freshwater NES apply to resource consent applications that involve farming activities, the modification of natural inland wetlands, reclamation of rivers and the passage of fish affected by structures. The Freshwater NES is intended to increase regulatory consistency and certainty across New Zealand, and ensure that any environmental effects of freshwater activities are appropriately managed.

As noted in section 4 of this AEE, the continued operation, use and maintenance of the Motukawa HEPS is not considered to trigger any resource consents under the Freshwater NES as:

- The diversion weir is an existing structure and is, therefore, not subject to Subpart 3 of the Freshwater NES (Regulation 60);
- The Ratapiko Dam is also an existing structure but is not a weir, so does not fall to be considered under Regulations 72 or 73; and
- Vegetation clearance, earthworks and the take, use, damming, diversion of water for the operation of specified infrastructure are provided for as a permitted activity under Regulation 46 and the relevant conditions can be met (irrespective of whether a natural inland wetland is proximate to these activities).

7.2.3.2 National Policy Statement for Renewable Electricity Generation

The NPSREG came into effect on 13 May 2011. It seeks to enable the sustainable management of renewable energy generation under the RMA.

The sole objective of the NPSREG is to provide for the development, operation, maintenance and upgrading of new and existing renewable electricity generation activities, so to increase the national level of electricity generated from renewable energy sources to a point that meets or exceeds the Government's national target for renewable electivity generation. The continued operation and maintenance of the Motukawa HEPS contributes to the achievement of this objective.

Policy A of the NPSREG focuses on recognising the benefits associated with renewable electivity generation activities. The continued operation and maintenance of the Motukawa HEPS would realise benefits by way of maintaining the electricity generation capacity of the Scheme, and assisting with the maintenance of the security of local electricity supply in the Taranaki Region. Additionally, the Scheme's utilisation of renewable natural resources assists in supporting the avoidance of reliance on thermal generation.

Policy B of the NPSREG requires decision-makers to have particular regard to the practical implications of achieving the national target for electricity generated from renewable energy sources. The NPSREG acknowledges that to achieve the national target, protection is required of the assets, operation capacity, and continued availability of the renewable energy resources, noting that even minor reductions in renewable energy generation have the potential to have significant adverse effects on generation output. The reconsenting of the Motukawa HEPS will maintain the existing electricity generation output of the Scheme and positively contribute towards achieving New Zealand's target for electricity generation from renewable resources.

Policies C1 and C2 of the NPSREG require decision makers to have particular regard to the practical constraints associated with the development, operation, maintenance and upgrading of new and existing renewable energy generation activities. The Motukawa HEPS has been operating for over 90 years – relying on consistent river flows and the head differential between the Manganui River and Waitara River to generate renewable electricity. As such, the utilisation of the renewable resource needs to occur in this location due to technical practicalities.

With respect to Policy C2, it seeks that decision-makers have regard to any offsetting measures or environmental compensation when considering any residual environmental effects associated with renewable electricity generation activities that cannot be avoided, remedied or mitigated. The *"National Policy Statement for Renewable Electricity Generation – Implementation Guidance"* by the Ministry for the Environment notes that it is up to the resource consent applicant to volunteer the offsetting of compensatory measures.

Based on the conclusions reached with respect to the actual and potential environmental effects of the Motukawa HEPS, it is considered that the effects can be appropriately managed with the implementation of avoidance, remediation, or mitigation measures, and

no additional compensatory or offsetting measures are proposed or considered necessary by Trustpower.

For the reasons detailed above, it is considered that the continued operation and maintenance of the Motukawa HEPS is consistent with the relevant objectives and policies of the NPSREG.

7.2.3.3 National Policy Statement for Freshwater Management

The NPSFM came into effect on 3 September 2020. It replaced the National Policy Statement for Freshwater Management 2014 (amended 2017) that preceded it, and every local authority is required to give effect to the NPSFM as soon as reasonably practicable. The RFWP was updated in June 2021 to give effect to the directive policy requirements of the NPSFM.

The fundamental concept of the NPSFM encompasses Te Mana o te Wai, a concept that refers to the fundamental importance of water and recognises that protecting the health of freshwater will protect the health and wellbeing of the wider environment. In effect, the NPSFM seeks to adopt a water-centric approach to freshwater management.[15] The sole objective of the NPSFM follows this concept – and seeks to ensure that natural and physical resources are managed in a way that (i) firstly prioritises the health and wellbeing of water bodies and freshwater ecosystems, (ii) then the health needs of people, and (iii) then the ability of people and communities to provide for their social, economic, and cultural wellbeing.

While this prioritisation approach will ultimately flow through to the establishment of allocation regimes and water quality limits for rivers in the Taranaki Region, Trustpower has given particular consideration to ensuring the flow regime proposed for the Manganui River downstream of the diversion weir and intake structure is appropriate to sustain the health and wellbeing of the river. In particular, Trustpower is proposing new consent conditions managing the operation of the Motukawa HEPS to ensure that the operation of the Scheme continues to ensure ecosystem health at all times – but especially during the summer months when water temperatures and algae blooms have the potential to cause undue adverse effects on the environment.

The policies of the NPSFM of potential relevance to the Motukawa HEPS relate to:

- The management of freshwater in a way that gives effect to Te Mana o te Wai;[16]

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[15] *Aratiatia Livestock Ltd v Southland Regional Council* [2020] NZEnvC 93 at [6] and *Otago Regional Council – Plan Change 7* [2021] NZEnvC.

[16] NPSFM Policy 1.

- The active involvement of tangata whenua in freshwater management;[17]
- The implementation of an integrated freshwater management approach;[18]
- Management of freshwater through a NOF to ensure that the health and well-being of degraded water bodies and freshwater ecosystems is improved;[19]
- The loss of river extent and values is avoided to the extent practicable;[20]
- The habitats of indigenous freshwater species are protected;[21]
- The habitat of trout and salmon is protected, insofar as such an outcome is consistent with the protection of indigenous species;[22]
- Freshwater is allocated and used efficiently;[23] and
- The passage of fish is maintained, or is improved, by instream structures (except where necessary to protect desired fish species).[24]

With respect to these matters, the following points are noted:

- Trustpower has sought to engage with representatives of the iwi forum through the preparation of the AEE for the Motukawa HEPS (as discussed in section 5.13), and this engagement is expected to continue once the resource consent applications are lodged via the preparation of a cultural values assessment. As such, further analysis for iwi and hapu interests in the Manganui River and the Waitara River may be required once the cultural values assessment is available;
- Trustpower has sought to adopt an integrated approach to the assessment of the potential effects of the Motukawa HEPS. This has included an assessment of the integrated management of the damming, diversion, take, and use of water from the Manganui River, and the discharge of water to the Makara Stream via the Motukawa HEPS. Furthermore, the various technical assessments have focussed on how the operation of the Motukawa HEPS impacts on the full extent of the Manganui River and Waitara River – not just the reaches immediately associated with the Scheme;
- While it is for the TRC to establish a NOF for waterbodies in the Taranaki Region, Trustpower has sought to ensure that the condition framework for the management of

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17 NPSFM Policy 2.

18 NPSFM Policy 3.

19 NPSFM Policy 5.

20 NPSFM Policy 7.

21 NPSFM Policy 9.

22 NPSFM Policy 10 and Clause 3.24(1).

23 NPSFM Policy 11.

24 NPSFM Clause 3.26(1).

flows in the Manganui River addresses the potential for adverse effects in the river that are potentially related to the operation of the Motukawa HEPS;

- As discussed previously in section 5 of this AEE, Trustpower and its technical consultants involved with the reconsenting applications for the Motukawa HEPS have worked to assess the actual and potential effects of the Scheme on the extent and values of the rivers and apply the effects management hierarchy. The Effects Management Hierarchy Table provided as **Appendix L** to this AEE assesses the effects of the Scheme on the rivers;
- With respect to the protection of habitat of indigenous freshwater species, the flow in the Manganui River downstream of the diversion weir will not be altered, such that there will be no changes to water depths, velocities and channel widths. The amount of habitat available for a species depends on its habitat requirements – with flow reductions resulting in habitat decreases for some species and increases for others. Despite this, recent fish community surveys have confirmed that Cran's and redfin bullies, longfin and shortfin eels, and torrentfish are all present within 1.7 km downstream of the diversion weir. Lamprey, longfin and shortfin eels, redfin bullies, inanga, koaro, shortjaw kokopu, and brown trout have all been identified in the diversion weir fish pass and/or upstream of the diversion weir. As such, it is considered that passage past the diversion weir (both upstream and downstream) is sufficient for the indigenous freshwater species in the Manganui River;
- Trustpower is not proposing to alter the habitat available for trout as part of this resource consent application. In this regard, the existing residual flow regimes (400 l/s) that apply throughout the year will not be altered, and the additional conditions that are proposed in order to minimise the potential for high water temperatures / algal blooms in the Manganui River downstream of the diversion weir will not preclude the movement of trout through the river. Additionally, the existing fish passes will continue to provide for trout movement within the Manganui River; and
- The diversion, take and use of water for the Motukawa HEPS is considered an efficient use of water. Trustpower seeks to maximise the use of water for the generation of electricity, subject to the capacity of the infrastructure in place.

For the reasons detailed above, it is considered that the continued operation and maintenance of the Motukawa HEPS can occur in a manner that is consistent with the relevant objectives and policies of the NPSFM.

7.2.3.4 Regional Policy Statement for Taranaki

The RPS became operative on 1 January 2010. The RPS provides an overview of the resource management issues of significance to the Taranaki Region and the objectives, policies and methods to be adopted to address those issues and achieve integrated management of natural and physical resources.

The objectives and policies in the RPS cover a broad range of topics that are relevant to the Motukawa HEPS. The topics of relevance are discussed in further detail below and include the use and development of resources; fresh water; indigenous biodiversity; natural features and landscapes, and amenity values; natural hazards; and energy. However, it is noted that the RPS has not been updated to give effect to the NPSFM.

Use and Development of Resources

Objective UDR 1 of the RPS seeks to recognise the role of resource use and development in the Taranaki Region, and its contribution to enabling people and communities to provide for their social, economic and cultural wellbeing. Due to the benefits of the Motukawa HEPS, the continued operation and maintenance of the Scheme would contribute to the wellbeing of the region.[25]

Fresh Water

The fresh water objectives of the RPS seek to sustainably manage the taking, use, damming or diversion of fresh water to enable people to meet their needs for water while safeguarding the life-supporting capacity of water and ecosystems, and protecting the natural character of water bodies.[26] These objectives need to be considered in light of the revised overarching direction provided by the NPSFM.

As noted in section 5 of the AEE, it is considered that the continued operation of the Motukawa HEPS can occur in a manner that will safeguard the existing values of the Manganui River, the Waitara River, and their tributaries. This will include the provision of conditions that provide for additional flows downstream of the diversion weir to manage high water temperatures, and flushing flows / artificial freshes to address any nuisance periphyton growth during summer. Furthermore, an enhanced trap and transfer regime will be implemented by Trustpower to strengthen the existing fish passage provided throughout the Motukawa HEPS to ensure the passage of indigenous species within the catchment.

The fresh water policies of the RPS encourage the utilisation of surface water for hydro-electric power generation when it will positively contribute to the wellbeing of people and communities.[27] The Motukawa HEPS generates electricity for the Taranaki Region, and as such would continue to have a positive influence on the wellbeing of people and communities.

The provisions of the RPS also encourage the maintenance or enhancement of natural water levels and flows in order to maintain natural character, instream values and life

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[25] RPS Policy UDR 1.

[26] RPS Objectives WAL 1 and WAL 2.

[27] RPS Policy WAL 1.

supporting capacity of water bodies.[28] The proposed continued operation and maintenance of the Motukawa HEPS will maintain water levels and flows within the Manganui River downstream of the diversion weir, however the implementation of the proposed new conditions (relating to temporary reductions in water diversion when water temperatures are high, and the release of flushing flows when substantial flows have not occurred in the last 30 days) will assist in maintaining instream and natural character values of the river.

The fresh water objectives of the RPS also strive to maintain and enhance the quality of water in rivers, streams and lakes, particularly when the waterbodies are recognised as having high natural character, ecological and amenity values.[29] The potential effects of the continued operation of the Motukawa HEPS are discussed in section 5 of this AEE, however it is noted that nuisance growths of periphyton occur in the Manganui River downstream of the diversion weir at times, and this is due to a combination of factors (including naturally high water temperatures and nutrient inputs from surrounding land use discharges). An enhanced flushing flow regime is now proposed by Trustpower to minimise potential water quality effects.

When considering the continued utilisation of structures located within the beds of the Manganui River, Lake Ratapiko, the Mako Stream, and the Makara Stream, the RPS seeks to ensure that use is appropriate, and any associated disturbance is minimised.[30] As the structures of the Motukawa HEPS are already established, their continued utilisation and maintenance will not generate substantial effects on the environment.[31]

The RPS encourages the maintenance and enhancement of appropriate access along rivers and lakes in the Taranaki Region.[32] The areas surrounding the Motukawa HEPS are not highly publicly accessible, however this is not as a result of the Scheme itself, but rather due to the location and topography of the Scheme. It is noted however, that Trustpower facilitate access to Lake Ratapiko to water skiing and jet boating clubs, allowing them to utilise the lake for water sports during summer.

Indigenous Biodiversity

Objective BIO 1 of the RPS seeks to maintain and enhance indigenous biodiversity in the Taranaki Region and Policy BIO 2 refers to adverse effects on indigenous biodiversity from the use and development of natural and physical resources being avoided, remedied or mitigated as far as is practicable.

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28 RPS Policy WAL 2 and WAL 3.

29 RPS Objective WQU 1.

30 RPS Objective RLB 1.

31 RPS Policy RLB 1.

32 RPS Objective WPA 1 and Policy WPA 1.

As previously discussed, the Aquatic Ecology Assessment has considered the potential effects of the continued operation of the Motukawa HEPS on indigenous biodiversity (particularly native fish). Additionally, the assessment has considered the implications of structures on the Manganui River, Mako Stream, and Makara Stream for fish passage. Whilst adverse effects cannot be avoided, Trustpower is proposing conditions relating to minimum residual flows, temporary reduction in diversion, fish passage, water temperature, flushing flows, and upstream and downstream trap and transfer programmes that support the maintaining and enhancing of indigenous biodiversity within the vicinity of the Motukawa HEPS.[33]

Amenity Value

Objective AMY 1 of the RPS seeks to recognise the positive contributions of appropriate use in terms of providing for the maintenance and enhancement of amenity values in the Taranaki Region. Within the vicinity of the Motukawa HEPS, the Manganui River is recognised as being valued for regionally important water quality, recreational fishery, and aesthetic values; Lake Ratapiko is recognised as being valued for recreational trout fishery and providing positive experiential qualities associated with the apparent naturalness of the lake contrasting the surrounding farmland; and the Waitara River is recognised as being valued for high natural character, ecological, recreational, and amenity values.

As noted in the Natural Character, Landscape and Visual Assessment, the Motukawa HEPS has positively contributed to natural and man-made landscapes (particularly Lake Ratapiko) that enhance the visual amenity of the surrounds.

Natural Hazards

Objective HAZ 1 of the RPS is to avoid or mitigate natural hazards within the Taranaki Region by minimising the net costs or risks of natural hazards to people, property and the environment.

The Ratapiko Dam structure is inspected and maintained in accordance with the NZSOLD guidelines, so as to ensure that it can be operated in a manner that avoids or mitigates the potential for natural hazard events (i.e. earthquakes and floods). Furthermore, potential flood risks in the Manganui River are reduced with flood waters being able to flow over the diversion weir; and in the Motukawa Race with the intake gates being closed during significant flood events to limit the flow in the race to that of local catchment flood inflow (additionally, flood waters in the Motukawa Race overflow into the Mangaotea Stream).

[33] RPS Policy BIO 7.

Energy

The provisions of the RPS that relate to energy promote the efficient development and production of renewable energy to meet the energy supply needs of the region and New Zealand.[34] These provisions largely reflect the direction provided by the NPSREG and the analysis provided in relation to that planning document is considered to also apply to these provisions of the RPS. That is, the Motukawa HEPS will contribute to the generation of renewable energy for the region.

Issues of Significance to Iwi Authorities

Chapter 16 of the RPS addresses the issues of resource management significant to iwi. Key aspects of the objectives and policies in this chapter relate to taking into account the principles of the Treaty of Waitangi and giving particular regard to the concept of kaitiakitanga in managing the use, development and protection of natural and physical resources. There is also emphasis on accommodating the views of individual iwi and hapu.

Trustpower has engaged with the iwi forum in an early and transparent manner so to establish an understanding of how their cultural or historical associations with the Manganui River and Waitara River may be affected by the continued operation of the Motukawa HEPS, and what measures may be implemented to address any potential associations. Further information on these associations is intended to be provided by representatives of the iwi forum as part of the cultural values assessment that is to be prepared. Further analysis of the provisions noted above may, therefore, be necessary at this time.

Summary

Overall, it is noted that the RPS has a focus on providing for social and economic wellbeing, as well as renewable electricity generation infrastructure. The Motukawa HEPS is consistent with these expectations.

With respect to the management expectations regarding the protection and management of natural resource values, and cultural values, it is considered that the Motukawa HEPS will be operated in a manner that is able to safeguard the key values of the Manganui River and Waitara River, and their tributaries, with the imposition of the conditions proposed.

Further assessment of the consistency of the Motukawa HEPS with the objectives and policies of the RPS will be made once representatives of the iwi forum have provided their cultural values assessment.

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[34] RPS Objectives ENE 1, ENE 2 and ENE 3.

7.2.3.5 Regional Fresh Water Plan for Taranaki

The RFWP became operative on 8 October 2001, and was updated in June 2021 to give effect to the NPSFM. The RFWP promotes the sustainable management of the freshwater resources of the Taranaki Region. The RFWP outlines important freshwater issues in the region, and provides objectives, policies and methods that are to be adopted when managing and addressing these issues.

The objectives and policies in the RFWP cover a broad range of topics that are relevant to the Motukawa HEPS. The topics of relevance are discussed in further detail below and include natural, ecological and amenity values and public access; tangata whenua; use and development of fresh water; and resource issues in the Taranaki Region.

Natural, Ecological and Amenity Values and Public Access

The natural, ecological and amenity values objectives of the RFWP seek to sustainably maintain, enhance and protect the stream, river and lake environments in the Taranaki Region.[35] As already noted above, particular consideration has been given to ensuring the flow regime proposed for the Manganui River downstream of the diversion weir, and the Waitara River downstream of the Motukawa Power Station tailrace are appropriate for sustaining the health and wellbeing of the rivers. In particular, Trustpower is proposing to introduce new consent conditions managing the operation of the Motukawa HEPS that are intended to ensure that the operation of the Scheme changes in response to potential changes in ecosystem health – especially during the summer months.

Objective 3.2.1 of the RFWP seeks to maintain and enhance public access along the regional fresh waterbodies. Due to locational and topographical constraints, public access around the Motukawa HEPS is not widely provided, however as noted previously, Trustpower facilitates access to the privately owned Lake Ratapiko by way of allowing water skiing and jet boating clubs to use the margins of the lake for clubrooms, and to utilise the lake for water sports during summer.[36]

Tangata Whenua

Objective 4.1.1 of the RFWP seeks to recognise and provide for the cultural relationship and values held by iwi and hapu of the region with fresh water in a manner that is reflective of their status as tangata whenua. Trustpower is continuing to consult with representatives of the iwi forum to ensure that their relationship with the Manganui River and Waitara River (and their tributaries) is maintained.[37]

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[35] RFWP Objectives 3.12, 3.13, 3.14, 3.15 and 3.16.

[36] RFWP Policy 3.2.1.

[37] RFWP Policies 4.1.1 and 4.1.2.

Further analysis of these provisions may be necessary once the cultural values assessment is available from the iwi forum.

Use and Development of Fresh Water

Objective 5.1.1 of the RFWP supports the sustainable use of freshwater resources (inclusive of the use of the beds of rivers and lakes) when the use will positively influence the social, economic and cultural wellbeing, and health and safety of people and communities.

The Motukawa HEPS and its sustainable utilisation of freshwater for the purpose of generating renewable energy and producing electricity for the Taranaki Region has been contributing to regional wellbeing since its establishment in the 1920s, and the beneficial influence of the Scheme will be maintained with the continued operation and maintenance of the Motukawa HEPS.[38]

NPS on Freshwater Management

As detailed in section 5 of this AEE, it is considered that the proposed take / diversion from the Manganui River, when implemented in conjunction with Trustpower's proposed conditions of consent, will support the life-supporting capacity of the fresh waterbodies associated with the Motukawa HEPS. Furthermore, the operation and maintenance of the Scheme in accordance with the proposed conditions of consent will provide appropriate mitigation of impacts on fresh water ecosystems.[39]

As noted above in relation to the provisions of the NPSFM, Trustpower and the technical consultants involved with the reconsenting applications for the Motukawa HEPS, have worked to assess the actual and potential effects of the Scheme on the extent and values of the rivers and streams associated with the Scheme. As detailed in **Appendix L**, it is considered that the loss of river extent and values has been avoided to the extent practicable.[40]

The Motukawa HEPS has provisions for fish passage throughout, with fish passes integrated into the diversion weir on the Manganui River and on the service spillway of the Ratapiko Dam. Fish trap and transfer programmes are also proposed throughout the Motukawa HEPS. Assessment of these provisions has determined that the fish passage provisions will be effective for facilitating fish passage upstream and downstream in the catchment, and will provide passage beyond that currently provided for in the existing consents.[41]

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38 RFWP Policy 5.1.1.

39 RFWP NPS Policy 5A.2.

40 RFWP NPS Policy 5A.4.

41 RFWP NPS Policy 5A.5.

Resource Issues in the Taranaki Region

Objective 6.1.1 of the RFWP seeks to promote the sustainable management of surface water while avoiding, remedying or mitigating any actual or potential adverse effects arising from the taking, use, damming or diversion of surface water.

The utilisation of surface water for the purpose of electricity production by way of renewable energy development has been occurring for several decades, and providing community and regional benefit by way of electricity provision and the security of supply, and via the enabling / facilitation of an important recreational resource (water sports) as a result of the damming of the Mako Stream to create Lake Ratapiko.[42] As such, the effects of the Motukawa HEPS on the natural, ecological and amenity features of the Taranaki Region have normalised in the surrounding environment, and the continued operation of the Scheme will not alter these features any further.[43]

The proposed continuation of the currently consented water take from the Manganui River will enable Trustpower to maintain electricity generation for use in the Taranaki region.[44] Trustpower is proposing to implement flushing flows and temporary diversion / abstraction reductions beyond those provided for in the existing consents to ensure ecosystem health in the Manganui River is sustained.[45]

Objective 6.6.1 of the RFWP seeks to promote the sustainable management of the beds of rivers and lakes by avoiding, remedying or mitigating any adverse effects of the use of the beds of rivers or lakes.

The structures of the Motukawa HEPS are already established in the Manganui River, Mako Stream, Lake Ratapiko and Makara Stream, and as such any potential effects relating to the structures and the use of the beds of the waterbodies are linked to the maintenance of the structures (as opposed to the development or deconstruction of the structures). Trustpower does not propose to alter the existing maintenance regimes of the Motukawa HEPS structures (many of which are permitted activities), and as such regular maintenance activities will continue to be undertaken throughout the Scheme in a controlled manner that avoids, remedies or mitigates any adverse effects on aquatic habitats and life, terrestrial flora and fauna, fish passage, water quality, flood risk, and the erosion or accretion of river and lake beds or banks.[46]

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42 RFWP Policy 6.1.5.

43 RFWP Policy 6.1.3.

44 RFWP Policy 6.1.3.

45 RFWP Policies 6.1.3, 6.1.4, 6.1.5, and 6.1.8.

46 RFWP Policy 6.6.1, 6.6.3 and 6.6.9.

The proposed dredging of Lake Ratapiko will take place on an 'as needed' basis during the period when the lake is drawn down annually for maintenance.[47] The drawing down of the lake will occur gradually over a 7-day period so to minimise the potential for fish stranding.

As noted above in relation to the RFWP's objectives and policies that give effect to the NPSFM, fish passage provisions throughout the Motukawa HEPS have been assessed as being sufficient and effective for the species known to reside within the vicinity of the Scheme, and will provide passage beyond that currently provided for in the existing consents.[48]

Regional Fresh Water Plan Summary

Overall, for the reasons outlined above, it is considered that the continued operation and maintenance of the Motukawa HEPS would be consistent with the relevant objectives and policies of the RFWP that seek to promote the sustainable management of freshwater resources in the Taranaki Region.

7.2.3.6 Tai Whenua, Tai Tangata, Tai Ao – Section 104(1)(c)

Tai Whenua, Tai Tangata, Tai Ao (Environmental Management Plan) is considered to be a 'relevant other matter' in accordance with section 104(1)(c) of the RMA. It is an expression of rangatiratanga and kaitiakitanga from Ngā Uri o Te Atiawa (descendants of Te Atiawa) over the environmental and cultural resources within the Te Atiawa rohe.

Tai Whenua, Tai Tangata, Tai Ao seeks to enable central government agencies, regional and district councils and any other consenting authority to acknowledge and provide for the relationship of Te Atiawa with the whenua, waters, taonga species, wāhi tapu / wāhi taonga, urupā and sites of significance to Māori within the rohe of Te Atiawa.

Tai Whenua, Tai Tangata, Tai Ao includes a number of objectives and policies of potential relevance to these resource consent applications, which include:

- Ensuring the principles of Te Mana o Te Wai in the NPSFM are implemented in the Te Atiawa rohe;
- Te Atiawa's relationship with water resources is recognised, respected, enhanced and protected;
- Te Atiawa's rights to freshwater be acknowledged through all allocation mechanisms and policies;

[47] RFWP Objective 6.6.1 and Policy 6.6.6.

[48] RFWP Policy 6.6.2.

- The mauri of freshwater resources is protected and enhanced in order to protect indigenous flora and fauna, provide a supply of drinkable water and enable the continuation of customary activities;
- Te Atiawa's rights and interests in freshwater resources in the Te Atiawa rohe are cultural, customary and economic in nature and that future allocation mechanisms should reflect this;
- Remediate and protect statutory acknowledgement waterways;
- Discharges of contaminants, low flows and loss of wetlands and riparian areas are managed to ensure water quality is improved;
- Water quality is of a sufficient standard within the Te Atiawa rohe to enable mahinga kai species to thrive; and
- Require that all structures in beds and margins of waterways support and enable fish passage for migratory native species.

As noted in section 6 of this AEE, Trustpower is engaged in a process with representatives of the iwi forum to build further understanding of the values attributed to the Manganui River catchment and how the potential effects of the Mangorei HEPS may be appropriately managed.

Notwithstanding the above, and as already discussed in this AEE, Trustpower is seeking to ensure that the continued operation of the Motukawa HEPS occurs in a manner that supports the health and wellbeing of the ecosystem values in the Manganui River and the Waitara River. This includes modifying the existing flow regime downstream of the diversion weir to respond to changes in water temperature and algae growth during summer periods, and expanding the trap and transfer programme so that it is more effective across the affected catchment.

It is considered that further assessment of Tai Whenua, Tai Tangata, Tai Ao may occur once the cultural values assessment is provided by representatives of the iwi forum.

7.2.4 Value of Investment – Section 104(2A)

In addition to the matters reference above, section 104(2A) of the RMA requires the consent authority when considering a renewal of an existing consent to "*have regard to the value of the investment of the existing consent holder*".

The value to Trustpower of its investment in the Motukawa HEPS can be considered in terms of either the insured value of the Scheme (approximately $12 million) or the foregone future earnings of the Scheme if it was forced to close. By both of these measures, the value of the Motukawa HEPS is significant to the existing consents' holder.

Further to its individual contribution economically, the Motukawa HEPS provides support for the broader portfolio managed by Trustpower.

Trustpower's geographically spread portfolio delivers a more secure and reliable supply for New Zealand when variable weather and hydrology in specific areas can impact supply across the National Grid. The Motukawa HEPS being embedded into the local distribution network means that when there are supply issues on the National Grid, supporting local demand can be directly contributed to by the Motukawa HEPS.

7.2.5 Part 2 of the Resource Management Act 1991

It is understood that a consent authority is generally no longer required to consider Part 2 of the RMA beyond its expression in the relevant statutory planning documents, unless among other matters the statutory planning documents have not been prepared in a manner that reflects Part 2 (i.e. due to invalidity, incomplete coverage or uncertainty of meaning within the statutory planning documents).

With respect to this proposal, it is noted neither the RPS or the RFWP give effect to the NPSFM (or the NPSREG in the case of the RFWP). As such, consideration is given to Part 2 of the RMA in the following paragraphs.

The Motukawa HEPS is an existing physical resource which is required to be suitably managed under Part 2 of the RMA. The continued operation of the Motukawa HEPS will enable the water resources available in the Manganui River and Lake Ratapiko to be utilised in a manner that will provide for the social and economic wellbeing of people and communities within the Taranaki Region. The use of the water resource to generate electricity will potentially avoid the depletion and use of non-renewable resources associated with other electricity generation facilities.

The continued operation of the Motukawa HEPS will also be undertaken in a manner that safeguards the life-supporting capacity of ecosystems. In this regard, Trustpower is proposing to avoid, remedy or mitigate the potential effects associated with the operation of the Scheme on the environment through a range of measures which are set out in the proposed consent conditions.

With respect to the key matters in section 6, 7 and 8 of the RMA, the following points are pertinent:

- The ongoing use of the Motukawa HEPS will maintain the existing natural character values of the Manganui River and Lake Ratapiko;
- The Motukawa HEPS will not impact on the protection of any outstanding natural features and landscapes;
- The flow regime in the Manganui River, along with the fish passes and the proposed trap and transfer programmes, are intended to protect and sustain the habitat of indigenous fauna within the catchment;

- Trustpower has been consulting with mana whenua in order to establish an understanding of their relationship with the Manganui River and Waitara River, and how their role as kaitiaki may be provided for. Further analysis may be required on this matter once the cultural values assessment is completed;
- The Motukawa HEPS will enable the efficient use of natural and physical resources (being water and the infrastructure in the river / lakebed) via the generation of electricity, which will contribute approximately 22 GWh of electricity per annum;
- The Motukawa HEPS contributes positively to the recreation opportunities in the Taranaki Region, and facilitates utilisation of Lake Ratapiko for water sports;
- Based on the conclusions made in section 5 of this AEE, particular regard has been given to the intrinsic values of ecosystems and the maintenance of the quality of the environment;
- The flow regime in the Manganui River, along with the fish passes at the diversion weir and other proposed consent conditions, are intended to protect the habitat of indigenous fauna within the catchment;
- There are multiple benefits to be derived from the development and use of renewable energy from the Motukawa HEPS. These range from national benefits (relating to contribution to the national renewable energy production targets) through to local benefits (and the provision of local security of electricity supply); and
- Although Trustpower is not a *"person exercising functions and powers under the RMA'*, consultation with mana whenua has been undertaken in good faith, with transparency and in a manner that reflects the scale and significance of this proposal.

Overall, and based on the technical assessments that have been commissioned by Trustpower, it is considered that the Motukawa HEPS will continue to operate in a manner that will promote the sustainable management of natural and physical resources in accordance with Part 2 of the RMA.

8. NOTIFICATION ASSESSMENT

Sections 95A – 95E of the RMA set out the steps to be adopted in determining whether a resource consent application should be publicly notified and if there are any persons who will be affected by an application.

In accordance with section 95A(3) of the RMA, Trustpower is requesting that this resource consent application be publicly notified. Therefore, no further analysis of the various steps under sections 95A – 95E of the RMA is required.

9. CONCLUDING STATEMENT

Trustpower proposes to continue to operate and maintain the Motukawa HEPS in the Taranaki Region. It is proposed that the Scheme will generally operate in a manner consistent with the existing resource consents issued in 2001, with the exception of the decommissioning of the intake structure / pumps in the Mangaotea Stream. Additional consent conditions are also proposed to ensure that the operation of the Scheme is responsive to potential changes in environmental conditions (i.e. water temperature and extended periods of low flow).

The Motukawa HEPS will also continue to contribute to the security of electricity supply in the Taranaki Region, as well as the Government's strategic targets for renewable electricity generation and the decarbonisation of the New Zealand economy.

A fulsome assessment of the actual and potential effects of the Motukawa HEPS on the environment is provided in section 5 of this AEE, as well as the various technical assessments commissioned by Trustpower. Overall, these assessments conclude that the continued operation of the Scheme can be undertaken in a manner that will appropriately sustain the key environmental values of the Manganui River and the wider catchment – recognising that the cultural values assessment is still being prepared and is also needed to provide an overall assessment of the potential effects of the Scheme.

With respect to the statutory planning framework that applies to the Motukawa HEPS, the continued operation of the Scheme is broadly consistent with the overall management intentions specified in the objectives and policies of the relevant national, regional and district planning documents. It is, however, recognised that further analysis of these matters may be necessary once the cultural values assessment is completed by mana whenua.

Overall, and based on the technical assessments completed, it is considered that the continued operation and maintenance of the Motukawa HEPS will promote the sustainable management of natural and physical resources and there are no impediments to the granting of the resource consents sought by Trustpower.