APPENDIX E

Natural Character, Landscape and Visual Assessment – Boffa Miskell

Boffa Miskell

Motukawa Hydro Electric Power Station

Natural Character, Landscape and Visual Assessment
Prepared for Chancery Green
FINAL
November 2021

Note: Since the lodgement of the resource consent applications for the Motukawa Hydro-Electric Power Scheme in November 2021 (being the application to which this technical assessment relates), the proposal by Manawa Energy has been amended to retain the consented maximum water take from the Manganui River as 5.2 m^3/s. The Assessment of Environmental Effects lodged with the resource consent applications has been amended to reflect this change, but the technical assessments associated with the application (including this one) have not been amended. However, all effects on the environment will either be the same or less than previously assessed in the lodged technical assessments.

Document Quality Assurance

Bibliographic reference for citation:
Boffa Miskell Limited November 2021. *Motukawa Hydro Electric Power Station: Natural Character, Landscape and Visual Assessment*. Report prepared by Boffa Miskell Limited for Trustpower Ltd.

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Status: FINAL	Revision / version: [0]	Issue date: 17 November 2021

Template revision: 20180621 0000

File ref: Natural Character Landscape and Visual Assessment - Boffa Miskell - Final_Nov_2021.docx

Cover photograph: *Boffa Miskell, Weir (Upstream of Take) Tariki Road South, 16 March 2021*

CONTENTS

Appendices

1.0 Introduction

1.1 Scope of the Report

Boffa Miskell Limited (BML) has been engaged by Trustpower to undertake a landscape, natural character and visual effects assessment for the proposed reconsenting of the Motukawa Hydro Electric Power Scheme ("Motukawa HEPS" or "the Scheme"). This assessment describes and evaluates the waterbodies, Scheme elements and surrounding landscape associated with the Scheme including:

- The upper, mid and lower reaches of the Manganui River, which includes the Mangaotea Stream (a tributary of the Manganui River);
- The Waitara River, which includes the Mako Stream, Makino Stream and the Makara Stream (all tributaries of the Waitara);
- The Motukawa Race;
- Lake Ratapiko; and
- Associated Scheme elements, such as the Manganui River weir and intake, and the Power Station.

The location of the Scheme in relation to the Waitara and Manganui catchments is depicted in Figure 1 of the A3 Graphic Supplement accompanying this report.

The report comprises three interrelated assessments of the attributes, values and potential effects of the Scheme on the areas of natural character, landscape and visual amenity. The scope and methodology of the assessments have been informed by the relevant statutory requirements, the nature and scale of the Scheme, and the existing and potential effects on the environment. The assessments address the following:

- Natural character assessment - considers effects on the elements, patterns and processes of the natural character of the waterbodies and their margins;
- Landscape assessment - considers effects on the physical landscape resource and character of the catchments in proximity to the Scheme corridor;
- Visual amenity assessment – considers effects on the visual amenity values of the waterbodies, surrounding landscapes and viewing audiences.

The assessments are based on the environment as it exists now, which comprises the water bodies, their margins and surrounding landscape in their current state, which have adapted over the past approximately 80 years to the Scheme flow regimes and modifications first implemented in the 1930's. Disregarding the presence of the parts of the Scheme such as the Motukawa Race and Lake Ratapiko would be contrived and it would not be practicable from a landscape / amenity perspective to postulate an unmodified pre-scheme environment. Ongoing and potential effects of the proposed reconsenting are assessed against the existing environment, and future water take and operational requirements of the Scheme.

1.2 Methodology and Approach

1.2.1 Relevant Guidance

This assessment has been undertaken by professional landscape consultants with reference to the NZILA Tuia Pito Ora - Guidelines[1] and the Quality Planning Landscape Guidance Note[2] and its signposts to examples of best practice.

1.2.2 Effects Ratings and Definitions

An outline of the effects ratings and definitions used in this assessment is provided in the Boffa Miskell: Natural Character, Landscape and Visual Effects Assessment Methodology (11 February 2019) attached as Appendix 1. In summary, the significance of effects identified within this assessment are based upon a seven-point scale which includes very low; low; moderate-low; moderate; moderate-high; high and very high ratings.

The nature of natural character, landscape and visual effects generated by any particular proposal can be:

- Positive (beneficial), contributing to the quality, character and visual amenity of the environment;
- Negative (adverse), detracting from the quality, character and visual amenity of the environment; or
- Neutral (benign), with essentially no effect on existing quality, character or visual amenity of the environment.

1.2.3 Relevant Background Landscape Assessments

There are a number of regional and district landscape assessments that have been undertaken within the Taranaki Region, but only two that cover the area where the Scheme is located:

- New Plymouth District Landscape Assessment prepared in June 1995 for the New Plymouth District Council by LA4 Landscape Architects; and
- Review of the New Plymouth District Landscape Assessment prepared in September 2006 for the New Plymouth District Council by LA4 Landscape Architects.

These assessments have been reviewed and the landscape character units and their description that relate to the Scheme location has been incorporated into Section 2.2 below.

1.2.4 Approach to Natural Character Assessment

This assessment of natural character applies to the potentially affected freshwater bodies and their margins in accordance with RMA section 6(a)[3]. While the RMA does not provide a

[1] New Zealand Institute of Landscape Architects Te Tangi a te Manu – Aoteoroa New Zealand Landscape Assessment Guidelines

[2] https://www.qualityplanning.org.nz/index.php/node/805

[3] Section 6(a)) considers natural character as a matter of national importance: *…the preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development*

definition of natural character, Objective 2 of the NZCPS[4] relates to preserving the natural character of the coastal environment and protecting natural features and landscape values through recognising the characteristics and qualities that contribute to natural character, natural features and landscape values and their location and distribution. The concept of natural character has been considered in a number of court decisions which have noted that "natural" and "natural character" may connote a range of qualities and features created by nature as distinct from artificial constructions, including things such as pasture, exotic trees, or wildlife, both feral and domestic.[5] A definition of natural character has also been adopted in the NZCPS guidance note[6].

Natural character comprises the natural elements, patterns and processes of waterbodies and their margins, and how they are perceived and experienced. This assessment interprets natural character as being the degree of naturalness of waterbodies and their margins' consistent with the above definitions:

The degree or level of natural character within an environment depends on:

1. *The extent to which the natural elements, patterns and processes occur.*
2. *The nature and extent of modification to the ecosystems and landscape / seascape.*
3. *The degree of natural character is highest where there is least modification.*
4. *The effect of different types of modification upon natural character varies with context and may be perceived differently by different parts of the community.*

The process to assess natural character involves an understanding of the many systems and attributes that contribute to a waterbody including biophysical and experiential factors. This can be supported through the input of technical disciplines such as river hydrology and morphology, aquatic and terrestrial ecology, and landscape architecture, which have all been drawn on for this assessment.

The natural character effects assessment involves the following steps:

- Description and assessment of the existing level of natural character;
- Description of any anticipated change to the natural character and the ongoing / future level of natural character; and
- Consideration of the significance of the effects.

Table 1 below describes the attributes and qualities used to describe and assess the level of natural character of the identified waterbodies / reaches, recognising that the active bed and margin have differing attributes and qualities.

[4] The Scheme is not located in the coastal environment and is not subject to the NZCPS

[5] *Harrison v Tasman DC* [1994] NZRMA 193 (PT); *Trio Holdings v Marlborough DC* W103A/96(PT),

[6] NZCPS 2010 Guidance note Policy 13: Preservation of natural character

Table 1: Natural Character Attributes

Biophysical (Active bed and margins)
1. Active Bed • *Flow Regime and Lake Levels – how natural / modified are the flows or lake level changes (dams, diversions, altered flow pattern / lake levels).* • *River or lake morphology- active bed shape, including sedimentation, structures and human modifications.* • *Aquatic ecology - Indigenous taxa assemblages, ecosystem functioning, Presence / absence of exotic aquatic flora and fauna, including presence of pest species. Periphyton and Macro invertebrates provide indication of water quality.* • *Water quality (if available).*
2. ***Margins*** • *Morphology- river bank or lake shore shape, including sedimentation, structures and human modifications.* • *Riparian vegetation and habitat – indigenous vegetation and fauna (birds, lizards), as well as presence of pest species.*
Experiential

• *Human perception of naturalness of waterbody. The expression of the biophysical attributes.*
  ○ *How natural does the area appear (dominance of human activity).*
  ○ *The remote / untamed experience.*
  ○ *Experiential attributes such as the sound of water, smells, feel and transient values.*

1.2.5 Landscape and Visual Amenity Assessment

Landscape character is derived from the distinct and recognisable pattern of elements that occur consistently in a landscape. This character reflects particular combinations of geology, landform, soils, vegetation, land use and human settlement. Landscape effects therefore result from changes in the physical components within an area, which in turn can alter the overall character and potentially the wider landscape. Such effects are typically the result of landform or vegetation modification or the introduction of new structures, facilities or activities necessary to facilitate a project. It should be noted that landscape effects can occur without being seen by a viewing audience.

When assessing the significance (level) of landscape change, it is important to consider the values associated with or derived from a landscape (e.g. its biophysical, sensory and associative values), the susceptibility of these to change, and the magnitude of the change proposed. Landscape effects deal with the effects of change, development and use of the landscape as a resource, rather than the effects on views and visual amenity for people.

Amenity values are defined in the RMA as:

> *…those natural or physical qualities and characteristics of an area that contribute to people's appreciation of its pleasantness, aesthetic coherence, and cultural and recreational attributes*[7]*.*

[7] Resource Management Act Section 7c

Visual amenity describes the pleasantness and aesthetic coherence of a place and comprises the visual and aesthetic aspects of amenity. The experiential and perceptual components of the landscape and natural character assessment contribute to the overall amenity values of an area.

Matters to be considered in relation to visual amenity are:

- **In river** - flow level, wetted surface / dry channel, substrate / rock material, water clarity, water colour, water movement, light reflection.
- **River / lake margins** - vegetation, levels of human modification, (e.g. structures, buildings, litter), seasonal colour, nature of exposed river / lake margin (e.g. substrate of margin, algal proliferations).
- **Visibility and viewing audience** - the nature and size of the viewing audience, with some reaches / areas more accessible and visible than others; their sensitivity e.g. recreational / residential audiences have a greater level of sensitivity than passing traffic or workers.

Operational changes that could affect the visual amenity are:

- Noticeable drop in river / lake water level and / or a change in the regular pattern of level fluctuations
- Changes to the clarity of the water in the lake or river (which may include sedimentation, periphyton or an increase in the extent of a muddy shoreline); and
- Changes to the character of the lake and riverbanks through flooding, erosion or debris.

1.2.6 Desktop Study and Survey

Prior to conducting the assessment, a desktop study was completed which included a review of the relevant information relating to the landscape and visual aspects of the applications. This information included:

- LINZ Map data, Aerial photography, Google Earth and Streetview; and
- Regional and District Plan assessments, provisions and map overlays.

Following the desktop study, river characteristics (where accessible) and the surrounding landscape context were surveyed on site visits undertaken with Trustpower personnel in September and October 2018, and subsequently by the author in February 2020 and March 2021.

Relevant background information has been drawn on for this assessment from the following Trustpower reports:

- Reconsenting of Motukawa Hydroelectric Power Station: Hydrology Report prepared by Tonkin and Taylor (November 2021);
- Motukawa HEPS Terrestrial Ecology Assessment of Effects prepared by Ryder Environmental (November 2021);
- Motukawa HEPS: Aquatic Ecology Assessment of Environmental Effects – prepared by Ryder Environmental (November 2021); and
- Motukawa Hydroelectric Power Scheme Reconsenting: Recreation Assessment - prepared by Rob Greenaway and Associates (November 2021).

2.0 Regional Landscape Context

2.1 Landscape Overview

Refer to Figure 1 in Appendix 2

The Taranaki Region is dominated by the 2,518 metre (m) cone shaped volcano of Mt Taranaki (Taranaki Maunga). The volcano and associated peaks and surrounding ring-plain of volcanic debris slopes gently seaward to the north and west and abuts the sedimentary hill country to the east. Approximately 8 m of rain falls annually on Mt Taranaki and more than 365 fast-flowing rivers emanate from the mountain in a radial pattern across the ring-plain. Taranaki Region is dissected by more than 20,000 kilometres (km) of rivers and streams which are a particular feature of the landscape. This includes the 39 km Manganui River which originates on the upper eastern slopes of Mt Taranaki and joins the Waitara River 10 km from the North Taranaki Bight coast. The Waitara River which arises in the eastern hill country, has a lower gradient than the Manganui (and others that flow from Mt Taranaki), is more silt laden and has a muddy bottom for much of its length. The vegetation pattern and ecology of Taranaki has been modified through extensive indigenous forest clearance which has been largely replaced by pasture grasses, exotic shelter belts and forestry.[8]

Prior to humans arriving, Taranaki was one of the most densely forested areas of New Zealand. However, the original forests of the Taranaki Ring Plain were mostly cleared and turned into pasture with only scattered remnant forests in reserves and covenanted areas. Everett Park Scenic Reserve, also called Everett Park, which is located adjacent to the lower reach of the Manganui River between the Scheme weir and the confluence with the Waitara River is one of the best remaining reserves of lowland forest in the region. Other indigenous vegetation within the Ring Plain is generally confined to stable cliffs and the riparian margins of streams. More forest remains on the inland mudstone hill country (including within the Waitara River catchment) where there are mixed indigenous forests, including the Moki, Rerekino and Makino Conservation Areas.

Mt Taranaki occupies a central place in the history and culture of Taranaki people – Maori and European. The mountain itself and the circular ring of protected forest surrounding the mountain– which forms the Egmont National Park, is an example of an associative cultural landscape that embodies both tangible and intangible values.

To the iwi of Taranaki, the mountain (Te Maunga) has deeply cultural and spiritual significance. To mana whenua (those with genealogical and local tribal authority over the land) the mountain is part of the landscape and an ancestor.[9]

In relation to the Motukawa Scheme, Pukerangiora (a hapu of Te Ātiawa iwi) and Ngāti Maru are recognised as the two mana whenua of the rohe where the Scheme operates. Both the Manganui and Waitara awa (waters) are of significance to Pukerangiora and Ngāti Maru who both have marae situated on the banks of the Waitara.[10]

[8] Te Ara Encyclopedia of New Zealand: Taranaki region.

[9] Te Ara Encyclopedia of New Zealand: Taranaki region

[10] Pukerangiora Hapu Summary; Ngati Maru Iwi Summary

Plate 1: Map of Taranaki Region[11]

2.2 Landscape Character Areas

Refer to Figure 2 in Appendix 2

Located on the northeast edge of the Taranaki Ring Plain, the broader landscape context features bush-clad Mt Taranaki and its lower developed slopes which are dissected by many bush-clad rivers and streams. The streams and river valleys are incised into the landscape and create a distinctive pattern in the Taranaki landscape. The 1995 landscape assessment of the New Plymouth District[12] identified thirteen landscape character units within the district. For each landscape character unit, a description, value and sensitivity are provided, as well as the identification of any that were / are considered to be Outstanding. The Motukawa Scheme is located partly within the 'Ring Plain Landscape Character Unit' (Unit 7) and partly within the 'Frontal Hill Country Unit' (Unit 6) to the east as illustrated in Plate 2 below and Figure 2 in Appendix 2.

[11] Te Ara Encyclopedia of New Zealand: Taranaki region

[12] New Plymouth District Landscape Assessment prepared in June 1995 for the New Plymouth District council by LA4 Landscape Architects

Plate 2: Landscape Character Units and the Motukawa Scheme

The Ring Plain Unit

This unit, which encompasses the Manganui River diversion, Motukawa Race and a small part of the western end of Lake Ratapiko, is a circular apron surrounding the base of Mt Taranaki characterised by successive eruptions of volcanic ash and the natural erosion of the volcanic materials. It extends in a circle around Mt Taranaki and slopes gently away from the mountain to the sea and Hill Country to the east.

As stated in the Regional Policy Statement for Taranaki 1994:

> *"Over 300 streams flow from the flanks of Mount Taranaki / Egmont in a distinctive radial pattern. These stream valleys are characterised by short narrow catchments of steep gradient. Stream channels are normally well incised into the volcanic ash and debris flow material of the ring plain."*

Its volcanic origins mean that the soils of the Taranaki Ring Plain are fertile and free draining and support intensive farming including dairying and horticulture.

The landform varies from flat near the coast, to rolling further inland. There are a number of lahar mounds and beehive shapes in various parts of the Ring Plain unit, particularly near Inglewood, which give character to an otherwise fairly flat rural landscape. In some places the stream corridors are very hard to see because they are so deeply etched into the landform and are very narrow. Further inland where the stream and river corridors all appear to run in roughly the same direction, they vary from wide stony mountain rivers with indigenous forest remnants

alongside, to very small streams. A range of indigenous forest remnants are also a feature, and many streams have riparian strips of indigenous vegetation.

From the air the strong landform and landscape patterns of the Ring Plain are revealed, particularly in the area south of New Plymouth. Many stream corridors cut down from Mt Taranaki, meandering and winding, forming hoops and horseshoe shapes. The streams are cut deep into the land.

This arrangement of meandering streams through the regimented pastoral paddocks (often further compartmentalised by hedges), creates a distinctive landscape pattern. There are a range of farmhouses and associated buildings and sheds in this landscape, mostly sited with vegetation around them.

The Ring Plain Unit was assessed as having a moderate ability to absorb change i.e. Visual Absorption Capability (VAC) and sensitivity to change (i.e. a rating of 4 on a 7 point scale), and was not considered regionally significant.

The Frontal Hill Country Unit

This Frontal Hill Country Unit covers the hill country to the east and north east of Inglewood, between the Ring Plain Unit and the Main River Valleys and Lakes Unit and Eastern Hill Country. The unit occupies a band of land about 12 km wide and contains Lake Ratapiko, the tunnel, penstock, Motukawa Power Station and tailrace. The landform is rolling in the western portion with a more strongly ridged landform further east. In the steeper country the ridges and peaks rise to a maximum height of 300 above sea level (asl).

A number of large river corridors meander through the unit, notably the Waitara River. The landform is cut through by many stream and river valleys. Many of the stream gullies have indigenous riparian vegetation.

Pasture is the predominant vegetation in this landscape unit although there are forest remnants on some of the hills and in the valleys. Exotic forestry is noticeable in places, and there is erosion evident on some of the steeper pastoral slopes. Farmhouses and farm buildings are sited on low ridgelines or on valley floors, generally near roads, usually surrounded by trees or vegetation with hedges and shelter belts a feature in some places.

This Frontal Hill Country Unit was assessed as having a moderate ability to absorb change (VAC) and sensitivity to change (i.e. a rating of 4 on a 7 point scale), and was not considered regionally significant.

3.0 Existing and Proposed Scheme

3.1 Location and Background

The Motukawa Scheme is located just within and beyond the eastern edge of the Taranaki Ring Plain between the Manganui River and Waitara River south-east of the Inglewood township. The Manganui River whose headwaters are on the north eastern slopes of Mt Taranaki is the largest tributary of the Waitara River.The Scheme makes use of water from the Manganui River and other tributaries in the two river catchments. The Scheme was commissioned in 1927 and produces an average annual power output of 22 GWh.

The Manganui River catchment emanates from near the summit of Mt Taranaki and collects water over 13.3 km^2 above SH3 and 80 km^2 above the Manganui River diversion weir. Below the weir the Manganui River catchment is much greater and is 362 km^2 at the Everett Park gauge.

The Scheme is located within a number of smaller landscape character areas which are reflective of the topography, soils, landcover and landuse between the Manganui and Waitara Rivers. The lower flatter plains are a predominately modified landscape consisting of rolling topography, with high production pasture, exotic woodlots, shelter belts, and small areas of regenerating indigenous vegetation. Pockets of mature and regenerating indigenous bush may be found in the steep sided stream and river gullies (often adjacent to or mixed with exotic species), and on forestry borders.

3.2 Scheme Description

Refer to Figure 3 in Appendix 2

In summary, the Scheme takes water from the Manganui River adjacent to Tariki Road South, transports it, via a 4.6 km long constructed water race (the Motukawa Race) to Lake Ratapiko (an artificially created 21 ha lake which is located to the west and east of Ratapiko Road).

From the lake, water discharges into a 2.7 km long tunnel before entering penstocks which feed the Motukawa Power Station located adjacent to Motukawa Road. From the Power Station the water enters the Makara Stream (via a 280 m tailrace) that runs adjacent to Motukawa Road for approximately 2.5 km, picking up a number of tributaries before it joins the Waitara River. The Manganui River joins the Waitara River 26 km downstream and from this point, the Waitara River continues for another 10 km to the sea where it enters the Tasman Ocean near the township of Waitara, some 16 km north-east of New Plymouth.

The Manganui River concrete intake weir and intake gates and screens are located just downstream of the Tariki Road bridge. A steep rocky, horseshoe shaped fish passage channel bypasses the weir on the east riverbank and an earlier fish passage is located at the western end of the weir which also permits water to flow over it. In the Motukawa Race between the intake and the lake there is an in-race generator, and further towards the lake the Mangaotea Aqueduct passes over the Mangaotea Stream. Pumps in the Mangaotea Stream also enable water to be abstracted from the stream into the race however these are to be decommissioned as part of the reconsenting.

3.3 Proposal

As outlined in the AEE,[13] Trustpower is seeking the necessary resource consents from the Taranaki Regional Council for the continued operation and maintenance of the Motukawa HEPS in response to the forthcoming expiry of the existing resource consents for the Scheme in June 2022.

The key activities that comprise the continued operation and maintenance which Trustpower is seeking resource consents for, are summarised as follows:

- The diversion and abstraction of up to 7.5 m^3/s of water from the Manganui River to the Motukawa Race. Currently the consent provides for a maximum of 5.2 m^3/s to be diverted to the race;
- The occupation and maintenance of a diversion weir, associated intake, and fish passes in the Manganui River;

[13] Applications for Resource Consents and Assessment of Environmental Effects prepared by Mitchell Daysh 2020

- The ongoing use and maintenance of the 4.6km long Motukawa Race, including two short tunnels, a race generator, and aqueduct at the Mangaotea Stream;
- The continued damming of the Mako Stream via a 12 m earth dam structure to form the 21 ha Lake Ratapiko and ongoing maintenance and sediment control in the lake;
- The abstraction of up to 7.787 m^3/s from Lake Ratapiko via an intake structure, tunnel, surge chamber and penstocks for the purposes of electricity generation at the Motukawa Power Station;
- The management of lake levels to avoid or minimise flooding of surrounding land to a maximum level of 198.7 m asl, and a minimum level of 194 m asl except during periods of maintenance;
- The discharge of water from Lake Ratapiko (during adverse weather conditions) via spillways to the Mako Stream; and
- The discharge of up to 8 m^3/s of water to the Makara Stream via a tailrace from the Motukawa Power Station.

Further detail on each of these key components, and the operating conditions proposed by Trustpower, is provided in the AEE. The key aspects of the project are summarised below based on information in technical reports, with particular reference to the mean monthly flow tables depicted in the Hydrology report.

Manganui River Diversion

Average flows in the Manganui River at SH3, located about 14.5 km upstream of the weir (catchment area 13.0 km^2) are approximately one fifth of those at the weir. The storage area where water is impounded by the Manganui Weir is relatively small, around 35 m wide by 500 m long, and generally located between the weir and the Tariki South Road bridge. The operating water level range at the weir is very narrow - generally less than 0.2 m when not in flood. Therefore, the weir operates as a “run-of-river” weir and the small changes in storage volume are negligible when hourly or longer averaging intervals are used to calculate inflow. If the weir is not naturally overtopped by at least 400 l/s for a continuous period of 30 days, then 400 l/s must be passed over the weir for three hours per day.

Spill flow at the weir is concentrated over the May to September months, with the mean spill flow of 4.7 m^3/s being 2.4 times the mean spill flow over the other months of the year. The combined residual flow from the left bank and right bank (fish passes) over the weir is relatively constant all year, being approximately 0.5 m^3/s.

Table 2 below provides the mean monthly flows, and observed flows, along the Manganui River at four locations, two above the weir and intake and two below, including one at the publicly accessible Everett Park. As depicted in Table 2 the observed flows during the March 2021 site visit, above the weir and intake were between the average and monthly minimum flows; and below the weir and intake the flows were close to the annual monthly minimum. At Everett Park the observed flow was 4.94 m^3/s compared with the average minimum of 15.58 m^3/s and monthly recorded minimum of 3.83 m^3/s.

Table 2: Annual mean, maximum and minimum monthly flows in m^3/s along the Manganui River over a 10 year period (2010 – 2020)[14]

Location	Mean Monthly Average	Average Minimum	Average Maximum	Monthly Minimum and Maximum	Site Visit Flows 16 March 2021
SH3	1.70 m^3/s	1.38 m^3/s	1.93 m^3/s	Minimum February 0.53 m^3/s, Maximum June 4.11 m^3/s	1.00 m^3/s
Above Weir and Intake	6.88 m^3/s	5.85 m^3/s	7.82 m^3/s	Minimum March 1.20 m^3/s, Maximum June 15.90 m^3/s	2.25 m^3/s
Downstream Weir / Intake	3.71 m^3/s	2.80 m^3/s	4.26 m^3/s	Minimum February 0.49 m^3/s, Maximum June 11.96 m^3/s	0.48 m^3/s
Everett Park	19.21 m^3/s	15.58 m^3/s	22.86 m^3/s	Minimum March 3.83 m^3/s Maximum September 53.64 m^3/s	4.94 m^3/s

Discharge of Water to the Waitara River

The Scheme discharges water from the Motukawa Power Station into a tailrace and then into the Makara Stream which flows to meet the Waitara River. Water discharged into the Mako Stream via the Ratapiko Dam spillways also returns to the Waitara River via the Makino Stream which joins the Waitara River approximately 9.5 km upstream of the Makara confluence.

When the water flow at Bertrand Road (approximately 45 km downstream of the Power Station) is less than 5,000 l/s (5.00 m^3/s), Manganui River flow must be passed directly over the weir or continuously through Lake Ratapiko and discharged into the Makara Stream.

Table 3 below provides mean monthly flows for three locations and observed flows at two sites along the Waitara River. As depicted in this table the observed flows during the March 2021 site visit, along the Waitara River below the Makara Stream confluence were close to the annual monthly minimum.

[14] Hydrology Report Table 3.8 Page 73

Table 3: Annual mean, maximum and minimum monthly flows in m^3/s along the Waitara River over a 10 year period (2010 – 2020)[15]:

Location	Mean Monthly Average	Average Minimum	Average Maximum	Monthly Minimum and Maximum	Site Visit Flows 16 March 2021
Above Makara Stream confluence	30.4 m^3/s	25.9 m^3/s	37.2 m^3/s	Minimum March 2.9 m^3/s, Maximum June 91.2 m^3/s	Not Available
Below Makara Stream (at Tarata)	34.2 m^3/s	29.3 m^3/s	41.9 m^3/s	Minimum March 3.3 m^3/s, Maximum September 94.6 m^3/s	7.35 m^3/s
Below Manganui River (at Bertrand Rd)	54.7 m^3/s	46.1 m^3/s	65.7 m^3/s	Minimum February 7.1 m^3/s, Maximum September155.7 m^3/s	12 m^3/s

Motukawa Scheme

Table 4 below provides mean monthly flows for four locations associated with the operation of the Scheme. three locations and observed flows at two sites along the Waitara River. As depicted in this table 3 the observed flows during the March 2021 site visit, at these various locations approximated the average minimum within the Motukawa Race and at the Power Station discharge, and the monthly minimum for the Manganui River spillflow and fish passage.

Table 4: Motukawa Scheme annual mean, maximum and minimum monthly flows in m^3/s over a 10 year period (2010 – 2020)[16]:

Location	Mean Monthly Average	Average Minimum	Average Maximum	Monthly Minimum and Maximum	Site Visit Flows 16 March 2021
Motukawa Race	3.17 m^3/s	1.99 m^3/s	3.77 m^3/s	Minimum March 0.26 m^3/s, Maximum August 4.93 m^3/s	1.84 m^3/s
Manganui Spillflow	3.18 m^3/s	2.28 m^3/s	3.71 m^3/s	Minimum February 2011 - 0.00 m^3/s, Maximum June 11.43 m^3/s	0.00 m^3/s

[15] Hydrology Report Table 3.10 Page 79

[16] Hydrology Report Table 3.7 Page 71

Manganui Fish Passage (left and right)	0.51 m^3/s	0.49 m^3/s	0.54 m^3/s	Minimum May 2010 - 0.42 m^3/s, Maximum May 2016 - 0.66 m^3/s	0.48m^3/s
Power Station Discharge	3.58 m^3/s	2.97 m^3/s	4.06 m^3/s	Minimum March 2010 - 0.01 m^3/s Maximum August 2017 - 6.44 m^3/s	2.00 m^3/s

Race and Mangaotea Stream Discharge

In 2014, take from the Mangaotea Stream peaked at 58 l/s, representing about 1.9% of the total race inflow into Lake Ratapiko. The operation and utilisation of the existing water intake structure (and pumps) in the bed of the Mangaotea Stream has ceased in recent years, and as such the take and use of water from the stream has not occurred. Replacement consents are not being sought for this take.

In emergency conditions the Motukawa Race may discharge of up to 2 m^3/s of water via the Mangaotea Aqueduct into the Mangaotea Stream.

Lake Ratapiko

Lake Ratapiko was constructed prior to the commissioning of the Scheme in 1927 to provide water storage for the Scheme. The lake is used for recreation purposes including power boat racing, water skiing and swimming. Lake Ratapiko must be maintained above a minimum level of 194 m asl except during periods of maintenance. The consented maximum lake level is 198.7 m asl, after which point the service spillway in the bed of the Mako Stream is activated. This provides for a maximum fluctuation in lake levels of 4.7 m, however during the previous 5 years (2016-2020) the lake was within 2 m of the of the consented maximum for 97% of the time and 1 m for 84% of the time. Daily fluctuations resulting from generation ramping are typically between 0.25 m and 0.40 m.[17]

Part of the re-consenting application will be the continuation of long-term maintenance dredging of Lake Ratapiko, and the associated deposition of dredged material onto surrounding paddocks. The dredging of the lake will provide for continued water conveyance throughout the Scheme.

The maintenance dredging activities involve the removal of up to 10,000 m^3 of material per year from the western arm of the lake, where sediment is observed to have accumulated. It is envisaged that dredging may not need to be completed every year but on an as required basis dependant on maintenance schedules, weather and operational requirements. The associated sediment from this operation is to be placed onto surrounding farmland paddocks to a nominal depth of 200 mm i.e. covering an approximate area of 5ha. This is to occur during the annual period of lake lowering which typically occurs in March for 2-4 weeks, where the lake level is drawn down to RL195 m.[18]

[17] Hydrology Report Page 106 (xiv)

[18] Construction Methodology for Removal of Silt Sediment from the Lakebed prepared by BTW Company 16 June 2021

Proposed Alterations to the Scheme

The main proposed change to the existing scheme operation is to increase the water take from the Manganui River from 5.2 m^3/s to 7.5 $m/^3s$. The predicted changes to the flows in the Motukawa Race and the residual flows in the Manganui and Makara Stream and Waitara River are outlined in Table 5 below.

Table 5: Motukawa Scheme: predicted change in mean monthly, maximum and minimum flows for 7.5 m^3/s race based on 10 year recordings period (2010 – 2020)[19]:

Location	Mean Monthly Average	Average Minimum	Average Maximum	Minimum and Maximum
Increase take in Motukawa Race	0.51 m^3/s	0.39 m^3/s	0.78 m^3/s	Minimum Nov/Dec and Feb to Apr 0.00 m^3/s, Maximum June 2.07 m^3/s
Reduction in Manganui Residual Flow	0.51m^3/s	0.39 m^3/s	0.79 m^3/s	Minimum Nov/Dec and Feb to Apr 0.00 m^3/s, Maximum June 2.07 m^3/s
Change in Ratapiko Spill Flow	- 0.07 m^3/s	- 0.59 m^3/s	0.02 m^3/s	Minimum Feb -3.57 m^3/s, Maximum Oct 0.08 m^3/s
Increase in Generation Flow / Discharge	0.55 m^3/s	0.32 m^3/s	0.78 m^3/s	Minimum Nov 0.00 m^3/s, Maximum June 2.05 m^3/s

4.0 Relevant Statutory Provisions and Strategies

In terms of landscape, visual and natural character matters consideration has been given to the following statutory planning documents:

- Resource Management Act (“‘**RMA**”)1991
- National Policy Statement for Freshwater Management 2020 (“**NPS-FW**”)
- Taranaki Regional Policy Statement (“**RPS**”)
- Regional Fresh Water Plan for Taranaki (“**Regional Freshwater Plan**”)
- Operative New Plymouth District Plan (“**ONPDP**”)
- Proposed New Plymouth District Plan (“**PNPDP**”)

[19] Hydrology Report Table 4.5 Page 94

4.1 Resource Management Act 1991

In relation to the RMA the key matters of relevance to this assessment are:

- Section 6(a) - the preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development;
- Section 6 (c) - the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna;
- Section 6 (d) - the maintenance and enhancement of public access to and along the coastal marine area, lakes, and rivers; and
- Section 7 (c) – the maintenance and enhancement of amenity values

There are no RMA Section 6(b) (outstanding natural features and landscapes) matters to consider.

4.2 National Policy Statement for Freshwater Management 2020

The NPS-FW contains a fundamental concept of Te Mana o te Wai that refers to the importance of water and restoring and preserving the balance between the water, the wider environment, and the community[20]. Under the overarching objective that prioritise firstly, the health of water and freshwater ecosystems; secondly the health needs of people; and thirdly the ability to provide for social economic and cultural well-being now and in the future. Policy 7 states:

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

Policy 7 is supported by Clause 3.24 (1) which requires the TRC to include the following policy (or words to the same effect) in its regional plan(s):

> "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."

Policy 5A.4.1 of The Regional Freshwater Plan contains the same wording as Policy 7 of the NPS-FW.

The NPS-FW defines the loss of value as being when a river is less able to provide for any value associated with ecosystem health, biodiversity, hydrological function, Maori freshwater values, and amenity.

4.3 Regional Policy Statement and Regional Plan

Chapter 10. Natural features and landscapes, historic heritage and amenity value, of the Regional Policy Statement (RPS) contains a number of relevant objectives and policies in relation to the Scheme reconsenting proposal; while the relevant provisions in the Regional

[20] NPS – FW Part 1.3 (1)

Freshwater Plan are outlined in *Chapter 10: Natural, ecological and amenity values and public access*. These documents seek the following outcomes:

- The protection of natural character and natural features and landscapes of regional significance associated with Taranaki's rivers, lakes and their margins. In protecting natural areas, regard is to be had to:
    - The value at local, regional and national scales, and the degree and significance of actual or potential adverse (including cumulative) effects;
    - The benefits to be derived from use and development at local, regional and national scales;
    - The natural area's sensitivity or vulnerability, and capacity to accommodate change without compromising values;
    - The degree of existing modification;[21]
- The recognition and appropriate management of natural areas that are of value for water quality and quantity; natural character, amenity, geological and geomorphological, botanical, wildlife and fishery values; and biodiversity and the functioning of ecosystems. The degree and significance of actual or potential adverse effects, including cumulative effects, on these natural areas and the efficacy of measures to avoid remedy or mitigate such effects; and the sensitivity or vulnerability of a natural feature or landscape to change, and its capacity to accommodate change, without compromising the values of the feature or landscape;[22]
- The avoidance, remediation or mitigation of adverse effects of inappropriate use and development, on amenity values, the promotion of positive effects, and the balancing of positive effects against adverse effects. This includes the scenic, aesthetic, and recreational opportunities provided by parks, reserves, rivers, lakes, wetlands and their margins;[23]
- The protection of the natural character of rivers, lakes and wetlands from inappropriate use and development and the adverse effects of appropriate use and development;[24]
- Maintenance and enhancement of natural, (ecological) and amenity values of rivers, streams and wetlands and their margins. Adverse effects will be avoided remedied or mitigated by having regard to the topography and form of the river, lake or wetland; the natural flow characteristics, hydrological functions and natural water levels; ecosystems; water quality; and recreational, aesthetic and scenic values;[25]
- Maintenance and enhancement, as far as practicable, of the high natural, (ecological) and amenity values, of rivers and streams listed in the Regional Freshwater Plan; and with adverse effects on those high values avoided, remedied or mitigated, as far as practicable;[26] and
- The maintenance and enhancement of public access to and along rivers and lakes.[27]

[21] RPS - NFL OBJECTIVE 1, NFL POLICY 3

[22] RPS - NFL OBJECTIVE 2, NFL POLICY 2,

[23] RPS - AMY OBJECTIVE 1 and 2, AMY POLICY 1

[24] Regional Plan - OBJ 3.1.3

[25] Regional Plan - OBJ 3.1.2, OBJ 3.1.5, POL 3.3.1

[26] Regional Plan - POL 3.1.4

[27] Regional Plan – OBJ 3.2.1

Of the natural features and landscapes identified in the area surrounding the Scheme, both the RPS (Appendix 1)[28] and Regional Freshwater Plan (Appendix 1A)[29] identify the Manganui River as a high value water body (down to the confluence with the Waitara River) with high natural, ecological and amenity values.

The upper Manganui River (OFB 4) is however considered to be an Outstanding Freshwater Body (upstream of the Tariki Road Trustpower weir) in the Review of the Regional Fresh Water Plan for Taranaki.[30]

The recognised values and significance of the Manganui River and Waitara River, as detailed in the Regional Freshwater Plan, are outlined below in Table 6.

Table 6: Extract from River and stream catchments of high quality or high natural, ecological and amenity values[31]

River or Stream	Water Quality	Recreational & Fishery Values	Aesthetic & Scenic Values
Manganui River	Excellent to good water quality throughout whole catchment. Low nutrients above SH3 and at the confluence with the Waitara River	Moderate access for indigenous fish. Presence of threatened species. Important habitat for threatened indigenous species. Very popular and highly valued angling river. Very highly rated for recreational uses and values (some swimming).	Very highly rated for aesthetic and scenic values.
Waitara River (middle reaches – from confluence with Manganui River to Bertrand Road)		Large river, access for fish to National Park.	Highly rated for aesthetic and scenic values.

4.4 New Plymouth District Plan (Operative and Proposed)

Refer to Figure 4 in Appendix 2

There are no Outstanding or Regionally Significant Landscapes or Outstanding Natural Features identified in ONPDP and no Outstanding Natural Character Areas or Natural Features and Landscapes identified in the PNPDP within or surrounding the Scheme.

[28] RPS Appendix 1: Rivers and stream catchments of high quality or high value for their natural, ecological and amenity values

[29] Regional Plan Appendix 1A: Rivers and stream catchments with high natural, ecological and amenity values

[30] Freshwater bodies of outstanding or significant value in the Taranaki Region

[31] Regional Plan Appendix 1A: Rivers and stream catchments with high natural, ecological and amenity values

Both plans reference the protection of natural character of rivers, lakes and wetlands as a resource management issue and encourage public access along priority / significant waterbodies with high recreation, scenic or amenity values. Both plans identify the Manganui River and the Waitara River as priority / significant waterbodies with ecological, natural character, cultural, amenity, scenic and recreational values, in line with the RPS and Regional Freshwater Plan.

The PNPDP identifies the artificially made Lake Ratapiko as one of four lakes that are Significant Waterbodies (in Schedule 9) for its ecological, natural character, recreational, public access, scenic and amenity values.

4.5 Tai Whenua Te Tangata Tai Ao Environmental Plan

The rohe of Te Atiawa extends from north to east of the peak of Taranaki Maunga and includes the Manganui River and much of the Waitara, as well as Lake Ratapiko and the waterways in its catchment. *Tai Whenua, Tai Tangata, Tai Ao* details Te Atiawa's role as kaitiaki and the application of tikanga to resource management within their rohe. "Developers and other applicants" are encouraged to use the document to inform project discussions with Te Atiawa.

Issues TTOM3 and TTOM6 in the Management Plan refer to freshwater quality and quantity and activities in the beds and margins of waterways and lakes, respectively, noting potential effects from low flows and over-allocation of water resources on mauri, mahinga kai habitat and species and customary use activities. Policies to manage effects on these values are detailed, including, for example, environmental flows and water allocation limits (TTOM4.2), and that all structures in beds and margins of waterways and lakes should enable fish passage for migratory indigenous species (TTOM6.8), and to provide access to waterways for, amongst other things, mahinga kai (TTOM7). Issue TTOM8 focuses on the sustainable management of customary, commercial and recreational freshwater fishing, using a variety of techniques – including rāhui – to protect and enhance freshwater fish stocks.

Schedule 7 of *Tai Whenua, Tai Tangata, Tai Ao* identifies specific 'Areas of Importance to Te Atiawa'. These include:

- Everett Park Scenic Reserve which is also a statutory acknowledgement area in the RPS[32]
- Manganui River and its tributaries
- Waitara River and its tributaries

Cultural and landscape values are often intertwined, and although this assessment does not consider cultural values specifically it is acknowledged that effects on landscape and visual amenity of waterways may have effects on cultural values.

[32] Appendix X- Regional Fresh Water Plan Statutory Acknowledgements – Appendix XH: Te Atiawa statutory acknowledgements

5.0 Existing Landscape and Natural Character Attributes and Values

5.1 Existing Landscape Character and Values

Refer to Figure 5 in Appendix 2

The Motukawa HEPS traverses 11km of farmland in an east-west direction between the Manganui and Waitara Rivers. The western end of the scheme crosses flat to rolling river plains and hills, and the eastern end encounters steep dissected hill country east of Lake Ratapiko. The land is a predominately modified landscape utilised for high production pasture, exotic woodlots and shelter belts, with areas of regenerating indigenous vegetation. Pockets of mature and regenerating indigenous bush are often found in the steep sided stream and river gullies. There are biophysical, sensory and associative landscape values afforded to the many areas affected by the Scheme. The affected areas are identified below, with associated values described in the sections that follow:

- Manganui River and tributaries;
- Waitara River and tributaries;
- Motukawa Race;
- Lake Ratapiko; and
- Motukawa Power Station, Penstocks and Tailrace.

5.2 Manganui River

Refer to Figure 6 in Appendix 2
Refer to 1.0 Manganui River photographs in Appendix 3

The Manganui River is a fast flowing river with a rocky / gravel bed. The river flow upstream of the Trustpower weir is largely unmodified excluding the Te Popo Stream tributary. Based on the identified values associated with the awa, the Upper Manganui River has been identified as an Outstanding Freshwater Body[33] (upstream of the Tariki Road Trustpower weir), and a high value waterbody[34] (down to the confluence with the Waitara River).

Because of the status of the upper river under the Regional Freshwater Plan, no consents have been granted to take or use surface water from the catchment above the Trustpower weir (excluding the Te Popo Stream). The water levels and natural flows upstream of the Trustpower weir are therefore a major contributor to the catchment's regionally important natural, scenic and recreational values, particularly within the Egmont National Park.

Specific values include its regionally important water quality, recreational fishery, and aesthetic values. The fast flowing nature of the river makes it very popular and highly rated for high-quality fly-fishing for both brown and rainbow trout. This occurs mostly upstream of the Tariki

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

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

South Road bridge and provides important habitat for trout spawning as well as having regional significance for indigenous fishery habitat values.

The headwaters of the river around the Manganui Gorge within the national park are viewed and enjoyed by thousands of people each year using 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 Kamahi / Tawa forest remnant on the west bank of the river and is a popular destination for walking and swimming. Apart from within the Egmont National Park and Everett Park Scenic Reserve, and at the few road crossings (at SH3, Croyden Road, Tariki Road South, Tarata Road and Bristol Road), the awa is not particularly accessible or visible to the general public.

The settlement pattern surrounding the river both upstream and downstream of the Trustpower weir and intake consists of farmland with dwellings and utility buildings that form a distinctive landscape pattern bordering local roads and streams which flow into the Manganui River.

While the river itself has high biophysical, sensory and associative values, particularly for mana whenua, the modified landscape context below Egmont National Park provides a typical rural landscape setting within which the river and its tributaries is contained.

5.3 Waitara River

Refer to 2.0 Waitara River photographs in Appendix 3

The Waitara River arises in the Eastern Hill Country (near SH43) approximately 12 km west of Mt Messenger at an elevation of 450 m asl. The river flows generally southwest for over 50 km before changing course (east of the Motukawa Power Station site) and flowing north through the Frontal Hill Country landscape for approximately 30 km where it joins the Manganui River and then flows a further 18 km to the sea at Waitara. The river catchment in total covers an area of 1,145 km^2.

After flowing through very steep and elevated land northeast of the Motukawa Power Station the landscape gradually widens out for the 27 km to the Manganui River and beyond to the sea. The vegetation within the wider landscape downstream of the Makara Stream (and power station) is typical of the Ring Plain and Frontal Hill Country comprising predominantly developed pasture with numerous patches of introduced and or indigenous scrub and forest.

Unlike most Taranaki rivers its upper reach from source to the Makino Stream has a muddy bottom and subsequently often has turbid waters during freshes and floods. Its middle and lower reaches from this point on are more typical of other Taranaki Ring Plain rivers, with the reach from the confluence with the Manganui River to the river mouth identified as a river with high natural character, ecological, recreational and amenity values.[35] This includes regionally significant values such as a trout fishery. Angling and whitebaiting also occur in the lower reaches of the river.

The Waitara River holds special value for Te Atiawa, Ngati Maru and Ngati Mutunga Iwi.

The settlement pattern surrounding the river upstream of the Makara Stream consists of extensive farmland, production forestry and areas of indigenous forest set within elevated hill country. Below the Makara Stream the landscape is similar to other areas of the foothills with a predominance of more intensive farmland with dwellings and utility buildings. This continues on towards the settlement of Waitara and the Tasman Sea.

[35] Regional Plan Appendix 1A: Rivers and stream catchments with high natural, ecological and amenity values

As with the Manganui River, while the Waitara awa has high biophysical, sensory and associative values, particularly for mana whenua, the modified landscape context provides a mixed rural landscape setting within which the river and its tributaries is contained.

5.4 Motukawa Race

Refer to Figure 7 Appendix 2
Refer to 3.0 Motukawa Race and Mangaotea Stream photographs in Appendix 3

The Motukawa Race is a 4.6 km long by approximately 6 m (range between 3 m and 13 m) wide constructed canal that extends from the intake structure at the Manganui River to Lake Ratapiko. Along its length it contains a number of elements as follows:

- A 10 ha settling pond ("Silt Pond"), some 275 m from the intake structure;
- A small weir and gauge at Tariki Road, some 200 m below the Silt Pond;
- An in-race generator (with shed), approximately 1.7 km from the Silt Pond;
- The Mangaotea Aqueduct (and shed), a further 570 m along the race from the generator; and
- Numerous road and farm crossings to provide access to properties and paddocks.

The Motukawa Race is a linear element within this relatively flat landscape, similar to many of the surrounding roads and farm races. Due to its flat nature, it is not particularly visible apart from at the road bridges / culverts.

5.5 Lake Ratapiko

Refer to Figure 8 in Appendix 2
Refer to 4.0 Lake Ratapiko and Mana Stream photographs in Appendix 3

Lake Ratapiko is located near the boundary of the Manganui and Waitara River catchments. The artificial lake is fed by the Motukawa Race and a number of small stream tributaries. It is approximately 3 km long and 21 ha in area and provides water storage for the Motukawa HEPS. The lake is contained by a 15 m high earth dam on the Mako Stream. It is a shallow lake, with an average depth of approximately 2.5 m, formed by the flooding of several shallow stream valleys including the Mako Stream. The lake has an operating range of 1.2m but more typically it operates within 1m of this range. The lake is a popular destination in the summer months for jet boating and water skiing, with clubroom facilities evident for both sports beside the lake on opposite sides of Ratapiko Road.

The lake has narrow vegetated riparian margins predominantly in exotic species and is surrounded by pastoral farming activities. The publicly accessible margins of the lake (owned by Trustpower) are leased and managed by the water skiing and jet boating club who maintain them as parkland with mown grass, shade trees, buildings, boat ramps and timber retained edges to facilitate the recreational uses. The dam and spillway at the Mako Stream are obvious manmade features in the lake margin. The Motukawa HEPS intake structure is located at the end of the eastern arm of the lake (previously the upper reach of the Mako Stream). The lake margins are physically intact and due to the managed nature of the lake levels, the margins are not affected by flooding or summer dry spells.

Riparian vegetation along the edge of Lake Ratapiko consists of a thin strip of indigenous and exotic species set within extensive developed pasture. Overall, the value of the lakeshore

vegetation is low due to the largely exotic species and surrounding farmland pasture. Similarly, whilst the lake edge and the lake itself provide habitat for water birds, it is subject to relatively high levels of disturbance from jet boating and the bird fauna is of a more limited range to what might be expected in a natural lake environment. Waterweed growth in the shallow lake may cause nuisance in the summer for the water sport users, however lake levels are generally maintained over summer for water sport users.

While the lake's presence is completely artificial it has naturalised over the decades and has some intrinsic qualities and natural characteristics of a lake. The lakebed and shores of the lake are defined by the natural stream valley landform which underlies it, with the addition of silt. The flow regime of the lake is highly modified, with inward and outward flows being completely controlled to maintain the required storage volumes of the Scheme. The lake contains three indigenous and two introduced fish species, and Fish and Game has introduced trout and perch. The trout fishery values are influenced by the lake's artificial nature and restricted fish passage. Water quality for recreation is very good, (no cyanobacteria blooms and low faecal bacteria) and suitable for swimming. Short residence time assists in maintaining water quality although at times the lake also has invasive aquatic weeds.

There are positive experiential qualities associated with the lake due to the apparent naturalness of the water body contrasting with the surrounding farmland. However, the wild and remote qualities are somewhat reduced by the presence of Ratapiko Road traversing the lake in addition to the recreational facilities and buildings associated with the water skiing and jet boating clubs.

5.6 Power Station, Penstock and Tailrace

Refer to Figure 9 in Appendix 2
Refer to 5.0 Power Station Area and Makara Stream Photographs in Appendix 3

The 2.875 km long water intake tunnel emerges via a surge chamber located in vegetated hills to the southwest of the Motukawa Power Station. From here the water flows via a 1.6 m diameter steel penstock (pipe) to the power house some 80 m below (north-east). The penstock is located above ground over a distance of approximately 1 km, where it then disappears underground for the final drop to the generators in the power station. An access road is located adjacent to the penstock up to where it emerges from the surge chamber. The power house and other ancillary buildings are located on flat land between the well vegetated Makara Stream margins, Motukawa Road to the east, and a vegetated hill immediately to west. Immediately to the north is a farmhouse and associated sheds, set within mature vegetation. These features provide screening of the Motukawa Power Station complex from the road and adjacent properties and ensure that it is well integrated into the local rural landscape setting.

The penstock is an obvious linear artificial element that contrasts with the surrounding hill country landform. Whilst the penstock is not noticeable from Motukawa Road or the adjacent farmhouses, it would be visible from elevated locations on the surrounding farms.

5.7 Visual Catchment and Viewing Audience

As outlined above 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. The exception to this is the popular Everett Park Scenic Reserve and the mainly local roads that cross the rivers at various locations. This lack of visibility is also due to the incised river morphology relative to the terraces and landforms surrounding the awa, as well as adjacent riparian vegetation. This profile and context make it

difficult to see the riverbeds and channels unless the viewer is located immediately adjacent to the bank, such as road / reserve access points, or bridge crossings.

As such the viewing audience is relatively small for most areas of the two rivers and streams. Visitors and recreational users at Everett Park Scenic Reserve, those kayaking or canoeing the lower reaches of the Manganui River and Waitara River during high flows, and private landowners, mainly from within a working landscape context, are the key audiences for these awa. Angling may also occur on the Manganui River (generally upstream of the weir) and Waitara River.

Two Marae are located on the banks adjacent to the Waitara River. The Te Upoko O Te Whenua marae (1704 Tarata Road) is located near the small community settlement of Tarata on the southern side of the river, between the Makara Stream and Manganui River. The Pukerangiora Pā Historical Reserve is located on a bluff overlooking the Waitara River approximately 5.2 km below the confluence with the Manganui River. These locations and the direct access to the river reinforce the cultural and spiritual values that the awa has for Ngāti Maru, Pukerangiora hapu and Te Ātiawa iwi.

Lake Ratapiko is a popular public recreation area valued for its jet boat and water ski activities as well as its scenic qualities, fishing and picnic areas,[36] and consequently has a relatively large local viewing audience in the summer months.

The New Plymouth Water Ski Club ("NPWSC") holds a lease for an area of land to the west of Ratapiko Road. This area of land contains a campsite for club members as well as a clubhouse, toilets, boating launching and tie up facilities, and play areas. The club utilises the western arm of the lake for their water ski activities and public access to this area is restricted to club members and their guests, therefore restricting use and views to this part of the lake. Views to the western arm of the lake are also restricted by dense vegetation along much of the road edge and lake margin.

Jet Boating New Zealand ("JBNZ") leases land from Trustpower on the eastern side of Ratapiko Road and utilises this arm of the lake for jet boating.[37] The eastern arm of the lake is more visible from the road and contains a grassed public area, and the water ski club's toilet block. There is also a boat ramp which provides lake access for the general public. Located across the other side of this publicly accessible area is a homestead located on the shores of the lake which utilises the lake side setting for weddings. The balance of the area surrounding Lake Ratapiko is only visible from adjacent and surrounding elevated farmland.

Outside of the area directly affected by the Scheme there are areas of the Manganui and Waitara River that are more accessible and visible to the public. This includes walkways adjacent to the Managnui River within Egmont National Park, tracks within forest parks located in the upper reaches of the Waitara catchment, the historic Bertrand Road bridge, and Waitara River walkways between SH3 and the river mouth.

5.8 Existing Natural Character Attributes and Values

Refer to Figure 10 in Appendix 2

The natural character of many rivers, lakes and wetlands in Taranaki have been modified to varying degrees by human activities such as vegetation clearance, farming, urban development, water abstraction for irrigation, and damming and diversion for hydro power. Nutrient and faecal bacteria concentrations in the Manganui and Waitara Rivers reflect the largely agricultural nature of the catchments. Those water bodies with the greatest degree of natural character

[36] Recreation Report – Para 3.2

[37] Recreation Report Section 2.2 and Figure 3

occur in the upper reaches of Ring Plain streams, the forested headwaters of the hill country rivers, and wetlands within Egmont National Park.

In order to understand the potential effects resulting from the Scheme, the natural character attributes and values of the full extent of the Manganui River and the Waitara River have been assessed. This assessment has been undertaken for each delineated river / stream reach as below. Each river and stream reach has been determined by analysing the water bodies and associated margin attributes and surrounding landscape character.

Manganui River Catchment:

- Reach One – within Egmont National Park
- Reach Two – between National Park and Tariki Road South Bridge
- Reach Three – Mangaotea Stream
- Reach Four – Tariki Road South Bridge to Waitara River

Waitara River Catchment

- Reach Five – above the Makara Stream confluence
- Reach Six - Mako Stream from Lake Ratapiko to Makino Stream
- Reach Seven – Makara Stream Tailrace to Waitara River
- Reach Eight – Waitara River from Makara Stream confluence to Manganui River
- Reach Nine – Waitara River from Manganui River to the Tasman Sea

5.9 Manganui River Catchment

5.9.1 Reach One: Egmont National Park

The Manganui catchment's headwaters lie on the north-eastern slopes of Mt Taranaki within the Egmont National Park. This reach of the river is approximately 10 km long and contains a natural and dynamic river system with natural flows and unmodified indigenous vegetation within the margins and adjacent landscape context. Within the park some track crossings and nearby huts and ski facilities provide access to the river margins and landscape.

NATURAL CHARACTER – Manganui River within Egmont National Park		Degree of Natural Character
Active bed - flow / water quantity	• Natural flows according to weather events – no water takes	Very High
Active bed - shape, incl. modifications / structures	• No modification to riverbed	Very High
Active bed - aquatic ecological health/ water quality	• Aquatic communities indicative of excellent health (MCI) • Presence of threatened indigenous fish	High
Margin - structures and modifications	• Minor structures associated with walking track crossings	High
Margin - terrestrial ecology	• Mosaic of indigenous species	High
Context	• Natural landscape within protected national park • Some modification due to access tracks, ski areas and huts adjacent to tributaries / headwaters.	High
Experiential	• Sense of remoteness, and scenic values within highly valued parkland	Very High
OVERALL RATING		**VERY HIGH**

5.9.2 Reach Two: Egmont National Park to Tariki Road South

Between the Egmont National Park and Tariki Road South the Manganui River traverses through farmland across the upper Ring Plain for approximately 14 km. Immediately downstream of where the river crosses SH3 near Midhurst is the confluence with the Te Popo Stream which also has its origins within the Egmont National Park. Between where the river crosses under Croyden Road and Tariki Road the Waipuku Stream joins the river on its true left bank. Like the other main tributaries within this section of the river this stream also has its origins in the Egmont National Park.

Below this point, the river and its tributaries continue to be located within farmland which is typical of the Ring Plain landscape. Throughout this reach, the river is generally meandering and incised, enclosed by a mix of indigenous and exotic plant species. The river varies between being several metres wide with deeper water set within vegetated embankments; to stretches containing shallow areas of shingle and rocks within and on banks adjacent to the riverbed; and narrow more incised lengths. Immediately upstream of the Tariki Road bridge are two identified SNA's containing indigenous forest. The river is identified as having moderate access for indigenous fish. Indigenous fish species known to be present in the upper reaches include redfin bully, inanga and short-jawed kokopu.

Notable elements and modifications within this reach of the river are as follows:

- Vickers Quarries located at the end of York Road set within a large area of indigenous vegetation, adjacent to the river and near the northern boundary of the national park.
- A small weir and bridge abutments under the railway bridge and adjacent to the SH3 crossing at Midhurst.

- A one-way bridge crossing and associated bridge abutments in the river margins at Croyden Road.
- A small farm weir / crossing between Croyden Road and Tariki Road.
- Some minor earthworks disturbance to river margins associated with farming activities.

NATURAL CHARACTER – Egmont National Park to Tariki Road South		**Degree of Natural Character**
Active bed - flow / water quantity	• Natural flows according to weather events – no water takes apart from within Te Popo Stream tributary	High
Active bed - shape, incl. modifications / structures	• Limited modifications to riverbed associated with weir at SH3 / rail overbridge, farm crossing and bridge abutments	Moderate - High
Active bed - aquatic ecological health / water quality	• Aquatic communities indicative of excellent health (MCI) • Presence of threatened indigenous fish • Water quality degrading at SH3 site based on 10 year records[38]	High
Margin - structures and modifications	• Some structures associated with bridge abutments and evidence of excavation / deposition of some margins • Some areas of valued indigenous forest (SNA)	High
Margin - terrestrial ecology	• Mosaic of indigenous and exotic species	Moderate-High
Context	• Quarry located just outside national park boundary in close proximity to river • Predominantly farmland along full extent of river landscape with associated tracks and buildings • Some indigenous forests. • Midhurst township adjacent to river near SH3	Moderate
Experiential	• Water clarity high at SH3 site but likely degrading[39] • Limited access to river however natural values would dominate within river environment	Moderate-High
OVERALL RATING		**HIGH**

5.9.3 Reach Three: Mangaotea Stream

The Mangaotea Stream is a tributary of the Manganui River which emanates from just north of Makara Road (between Croyden Road and Ratapiko 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 typical of the mid to lower Ring Plain. Approximately 2.8 km downstream from its source it crosses under the Motukawa Race via an aqueduct and continues on adjacent to Mangaotea Road for a further 800 m before it crosses under Tariki Road via a culvert. There are several culverts along the stream length that provide for farm access tracks. Pumps (located in a shed above the aqueduct) can be used to divert water from the stream to the water race. The maximum consented take is 38,880 m^3/day at a maximum rate of 450 l/s which requires a residual flow to be provided of 94 l/s, however as noted previously a take from the Mangaotea Stream has not occurred for some time and is not being reconsented as part of this project. The

[38] Aquatic Ecology report, Page 17

[39] Aquatic Ecology report Page 17

length 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. This stream and the wider catchment area are prone to flooding during high rainfall events.

NATURAL CHARACTER – Mangaotea Stream		**Degree of Natural Character**
Active bed - flow / water quantity	• Natural flows apart from the Motukawa Race aqueduct where pumps at the aqueduct can be used to divert water from the stream into the Motukawa Race (94l/s residual flow required).	Moderate
Active bed - shape, incl. modifications / structures	• Stream bed modified in places through straightening and channelization to assist with ongoing drainage and farming operations	Moderate-Low
Active bed - aquatic ecological health / water quality	• Water quality assumed to contain contaminated runoff from adjacent farms	Moderate-Low
Margin - structures and modifications	• Some structures associated with culverts / bridges • Aqueduct at Motukawa Race • Margins contain spoil from drainage	Low
Margin - terrestrial ecology	• Long sections devoid of vegetation. • Some areas contain exotic trees and shrubs • No observable indigenous vegetation	Low
Context	• Located within intensive farmland with very few natural elements associated with stream or its tributaries	Low
Experiential	• Stream dominated by farming activities with minimal experience of natural values.	Very Low
OVERALL RATING		**LOW**

5.9.4 Reach Four: Tariki Road South to Waitara River

This reach of the Manganui River extends from upstream of the Trustpower weir to the confluence with the Waitara River – a distance of approximately 20 kms. It contains the weir, intake structure and fish passage structures. Below this the river is generally narrow, typically 10-30 m wide set within a channel of 30-100 m width. The riverbed is generally cut down into the surrounding land with often steep banks that are densely vegetated with both exotic and indigenous species. Many larger areas of indigenous vegetation remain in association with river bends and old river terraces. The clear and often fast running water runs over and through rapids and pools of the rock and gravel bed. The river reach receives water from a number of tributaries (including Mangaotea Stream), and the larger Mangamawhete Stream, Waitepuke Stream, Mangetawa Stream, Piaka Stream, Ngatoroiti Stream, and Ngatoro Stream, which all emanate from the upper flanks of Taranaki Maunga and the Ngatoro Stream, and all enter the Manganui River above Everett Park, and the Mangatiti and the smaller Mangapotoa Streams between Everett Park and the Waitara River.

The wider landscape is typical of the lower Ring Plain with developed pasture with patches of indigenous and exotic vegetation. Downstream of the weir are two protected forests – the Pirinoa Key Native Ecosystem (KNE) (4.5 km) and Everett Park Scenic Reserve KNE (18 kms) both on the true left (western side) of the river. Everett Park is the only location within this reach where the public have access to the river. There are two road crossings of the Manganui River below Tariki Road South, one at Tarata Road (approximately 6 km downstream), and the other at Bristol Road (a further 3 km downstream), immediately upstream of Everett Park.

NATURAL CHARACTER –Tariki Road South to Waitara River		Degree of Natural Character
Active bed - flow / water quantity	• Flow regime is highly modified by diversion of water in the Motukawa Race. • Consent requires varying minimum flows throughout year no less than 400l/s. High flows and floods spill over weir. • Balance of river receives water from tributaries, with increased flow at Everett Park	Low
Active bed - shape, incl. modifications / structures	• River morphology modified by weir and associated structures. • Balance of river shape largely unmodified below weir and intake	Moderate
Active bed - aquatic ecological health / water quality	• Water quality lower downstream of intake than at SH3 likely due to more intensive land use • Water temperature higher downstream of intake in summer increasing risk of periphyton growth • Aquatic community health (MCI) decreases downstream from 'excellent' at SH3 to 'fair-poor' at Bristol Road, but 'good' health upstream and downstream of intake[40]. • Presence of a diverse indigenous fish community throughout reach and above weir via fish passage	Moderate
Margin - structures and modifications	• Weir, intake, fish passage modifications to river margins. • Some structures associated with bridges and evidence of access to riverbed on private land.	Moderate
Margin - terrestrial ecology	• Mosaic of indigenous and exotic species	Moderate-High
Context	• Predominantly farmland along full extent of river landscape with some extractive industries and energy facilities e.g. wells.	Moderate-Low
Experiential	• Multiple built structures around weir reduce natural experiential values around Tariki Road South. • Limited access to balance of river (apart from Everett Park) however within river natural values would dominate • The developed land use and other activities adjacent to the river reduce the experience of naturalness and wildness • The fish passage structure has a somewhat natural appearance due to its rocky formation and largely indigenous riparian vegetation • Experiential attributes such as sound of water, smells, still occur and can be appreciated albeit with less water volumes. • Transient experiences of high floods would not be greatly impeded by the weir.	Moderate
OVERALL RATING		**MODERATE**

[40] Aquatic Ecology Report – Page 44

5.10 Waitara River Catchment

5.10.1 Reach Five: Above the Makara Stream confluence

The head waters and upper catchment down to Purangi is characterised by large areas of indigenous bush and some exotic forest whereas below this the landscape gradually becomes more dominated by extensive pastoral farming (often on eroding hill country) with a mix of forestry and indigenous bush, with large areas devoid of riparian vegetation. Upstream of the Makara Stream the Waitara River very quickly changes to a muddy bottom.

NATURAL CHARACTER – Waitara River Upstream of Makara Stream		**Degree of Natural Character**
Active bed - flow / water quantity	• Natural flows according to weather events.	Very High
Active bed - shape, incl. modifications / structures	• Limited crossings and modification to the morphology of the riverbed	High
Active bed - aquatic ecological health / water quality	• Changes to level of sedimentation / water colour evident (via aerial photos) through the upper to mid catchment. • Poorer water quality than Manganui River[41]	Moderate
Margin - structures and modifications	• Evidence of logs within and across river upstream of Junction Road / Purangi. Some river road and farm crossings. • Farm tracks along riverbanks in some areas	High
Margin - terrestrial ecology	• Margins are often devoid of tree and shrub vegetation • Mix of exotic and indigenous species in places • Evidence of erosion from steep surrounding farmland •	Low
Context	• Maki Forest, Makino Forest and Rerekino Forest within catchment • Largely inaccessible (apart from above forest tracks) with large private landholdings with very few dwellings.	Moderate High
Experiential	• Largely inaccessible to public. • Sense of remoteness within dominant farmland landscape • Low water clarity[42]	Moderate High
OVERALL RATNG		**MODERATE HIGH**

5.10.2 Reach Six: Mako Stream - Lake Ratapiko to Makino Stream

Mako Stream is a small stream that was dammed to form Lake Ratapiko. There is no residual flow requirements however the stream receives water flow from seepage from the dam and spillway overflows when the lake levels are high. From the remnant upper reaches of the stream the stream channel joins two other small tributaries before crossing under the Mana Road

[41] Aquatic Ecology Report – Page 20

[42] Aquatic Ecology Report – Page 20

bridge. A service spillway located adjacent to Ratapiko Road provides for discharge from the lake under a bridge into the stream several times a year. Further along this road (that provides access to a private residence and farm on the shores of the lake) there is also an emergency spillway located between the service spillway and the dam. Fish passage is provided at the service spillway and expected fish species are found downstream of the dam. Below the Mana Road bridge several tributaries (including the Makara Stream – a second stream with this name in the catchment which emanates from near Midhurst) join the deeply incised Mako Stream along its approximate 8 km length. The land use surrounding the stream comprises of pastoral farmland. The stream margins and the steep banks are densely vegetated with a mix of exotic and indigenous species, including some plantation forestry.

NATURAL CHARACTER – Mako Stream to Makino Stream		**Degree of Natural Character**
Active bed - flow / water quantity	• Flow heavily modified in upper reach for approximately 1.2 km through damming and formation of lake • Below Mana Road water course tributaries increase water flow to relatively natural flows according to weather events – no water takes	Moderate-Low
Active bed - shape, incl. modifications / structures	• Dam, impounded water body and road have modified natural shape of stream bed. • Little modification to stream bed below Mana Road	Moderate
Active bed - aquatic ecological health / water quality	• Fish passage provides for aquatic communities downstream of dam	Moderate
Margin - structures and modifications	• Dam and spillways have modified upper reaches • Minor structures associated with bridges downstream of lake	Moderate
Margin - terrestrial ecology	• Mosaic of exotic and indigenous species	Moderate
Context	• Predominantly farmland along full extent of stream landscape.	Moderate-Low
Experiential	• Stream dominated by farming activities with minimal experience of natural values.	Moderate Low
OVERALL RATING		**MODERATE**

5.10.3 Reach Seven: Makara Stream

The Makara Stream drains a small catchment in steep hill country used for extensive pastoral farming and forestry. The stream is steep, fast flowing and deeply incised into the landform. The steep banks and margins are densely vegetated with predominantly indigenous trees and shrubs.

The tailrace of the Scheme discharges into the Makara Stream which meets with the Waitara River 1.8 km downstream. Subsequently the flows in the stream are affected by the powerhouse outflows. The upstream catchment broadly follows Motukawa Road for approximately 4.5 km.

NATURAL CHARACTER – Makara Stream		Degree of Natural Character
Active bed - flow / water quantity	• Flow affected by discharge from power station to tailrace and then into stream • Flows into Makara range from annual mean average of 3.17 m^3/s, min 1.99 m^3/s, max 3.77 m^3/s	Moderate-Low
Active bed - shape, incl. modifications / structures	• Outfall structure from tailrace into stream	Moderate-High
Active bed - aquatic ecological health / water quality	• Fish species are present upstream and downstream of the tailrace. • Elevated nutrient levels however water quality above minimum acceptable state[43]	Moderate
Margin - structures and modifications	• Affected by tailrace, road bridge abutments and culverts	Moderate
Margin - terrestrial ecology	• Mosaic of exotic and indigenous species along with pasture • The marginal vegetation and habitat below the outfall has higher terrestrial ecological values than the sites discussed above (Manganui River, Lake Ratapiko). This is due to the indigenous vegetation along the immediate margins and the more diverse ecological landscape; there are many patches of indigenous bush / scattered shrubland in the vicinity, meaning that it forms part of a wider, more valuable habitat mosaic (compared with extensive pasture).	Moderate-High
Context	• Predominantly farmland along full extent of stream landscape. • Overhead power lines part of landscape context	Low
Experiential	• Stream dominated by farming activities with minimal experience of natural values. • The stream in its deeply cut and vegetated channel is not easily visible, but the sound of rushing water is audible from nearby	Moderate
OVERALL RATING		**MODERATE**

5.10.4 Reach Eight: Makara Stream to Manganui Confluence

From the Makara Stream entry to the Waitara River the river generally follows Motukawa Road to the small settlement of Tarata and then beyond this Toetoe Road (on the left bank) and Otararoa Road (on the right bank) to the Manganui River. The landscape in this area is more intensively farmed, with river terraces and surrounding undulating topography used for pastoral farming. There is also evidence of well heads and energy facilities to the east of the river accessed off Otaraoa Road and near the Bristol Road bridge crossing. The riverbed in this section has a bolder / stony bottom with areas of rapids. Vegetation is more prevalent along the riverbanks and consists of a mix of pasture, indigenous and exotic trees and shrubs with some pine forest. The Waitara River is set in a more diverse ecological landscape, with some patches of indigenous and / or exotic forest and shrubland up to tens of hectares in area. It also passes close to (within 1 km of) the Taramoukou Conservation Area, a large area of indigenous forest.

[43] Aquatic Ecology Report – Page 36

NATURAL CHARACTER – Waitara River from Makara Stream to Manganui Confluence		Degree of Natural Character
Active bed - flow / water quantity	• The flow regime is slightly increased at the Makara Stream confluence by the HEPS generation outflows.	High
Active bed - shape, incl. modifications / structures	• In bed structures confined to river crossings at Bristol Road and Tarata Road	High
Active bed - aquatic ecological health / water quality	• Similar water quality as upstream reach (Reach Five) • Elevated nutrient levels not apparent	Moderate
Margin - structures and modifications	• Largely intact. Affected by road bridge abutments	Moderate-High
Margin - terrestrial ecology	• Mosaic of exotic and indigenous species along with pasture	Moderate-High
Context	• Predominantly farmland along full extent of stream landscape. • Wells and energy generation facilities • Overhead power lines crossing river and part of landscape context	Moderate-Low
Experiential	• The river is not easily visible apart from at road crossings and in locations where the adjacent roads are located near the riverbank • The visible stony bottom and rapids with the sound of rushing water is audible from nearby locations	Moderate-High
OVERALL RATING		**MODERATE-HIGH**

5.10.5 Reach Eight: Manganui River to Tasman Sea

From the Manganui River confluence, the Waitara River meanders through lowland topography (below 100 m asl) for 10 km before reaching the Coastal Marine Area at the township of Waitara. Along this stretch the river is crossed by the Bertrand Road bridge and SH3. The landscape in this area is a mix of farmland, energy facilities and urban development. The upper stretch of riverbed in this section has a bolder / stony bottom with areas of rapids, however towards the sea the bed is muddy with areas of shingle and rock rubble retained edges. Much of this lower stretch is also tidal. Vegetation is less prevalent along the riverbanks and consists of a mix of pasture, and exotic trees and shrubs.

NATURAL CHARACTER – Waitara River from Manganui Confluence to Tasman Sea		Degree of Natural Character
Active bed - flow / water quantity	• The flow regime is unmodified by the Scheme and varies through weather and rainfall conditions.	High
Active bed - shape, incl. modifications / structures	• Numerous in bed structures associated with river crossings at Bertrand Road and SH3 road crossings, jetty, boat ramp, and groynes.	Moderate
Active bed - aquatic ecological health / water quality	• Similar water quality to upstream locations • Elevated nutrient levels not apparent	Moderate
Margin - structures and modifications	• Affected by road bridge abutments at river crossings (Bertrand Road and SH3), jetty, boat ramp, groynes, and rock retaining along river edge.	Moderate-Low
Margin - terrestrial ecology	• Mainly exotic species along with pasture, parkland and urban development	Moderate-Low
Context	• Predominantly farmland and urban development • Wells and energy generation facilities • Overhead power lines crossing river and part of landscape context	Moderate-Low
Experiential	• The river is not easily visible apart from at road crossings and in locations where the adjacent roads are located near the riverbank • The visible stony bottom and rapids with the sound of rushing water is audible from nearby locations • Lower portion of river is accessible and experienced by local community and boaties within urban context.	Moderate-
OVERALL RATING		**MODERATE**

5.11 Summary of Natural Character Values

River and Stream Reach Name	Overall Degree of Natural Character Ratings
Manganui River Catchment	
Reach 1 – Egmont National Park	Very High
Reach 2 - National Park to Tariki Road South	High
Reach 3 - Mangaotea Stream	Low
Reach 4 –Tariki South Road to Waitara River	Moderate
Waitara River Catchment	
Reach 5 –Above Makara Stream confluence	Moderate
Reach 6 – Mako Stream - Lake Ratapiko to Makino Stream	Moderate
Reach 7 – Makara Stream	Moderate-High
Reach 8 –Makara Stream to Manganui River	Moderate-High
Reach 9 – Manganui River to Tasman Sea	Moderate

6.0 Natural Character, Landscape and Visual Amenity Effects

6.1 Effects on Natural Character

The primary impact of the Scheme relates to the reduced flow in the Manganui River as a result of the diversion to the Motukawa Race. The reduced flow in the river is limited to the 6 km residual flow reach (i.e. from the intake structure to the Waitara River), as the discharge from the Motukawa Power Station, combined with other sub-catchment flows, results in higher mean flows in the Waitara River downstream of the Scheme and confluence with the Manganui River.

The changes to the morphology of the Manganui River due to the construction of the weir, has further reduced the natural character values that previously resulted from settlement and associated vegetation clearance, water abstraction, farming and urbanisation. While a short section of the Manganui River (associated with the weir, intake structure, and reduced water flow) and the Mako Stream (associated with the damming and only periodic water flow in the upper reaches of the stream above the Mana Road bridge) are highly modified as a result of the Scheme, the majority of the rivers and stream reaches have constant water flows and limited modification to the morphology, water quality and aquatic ecology values.

With the proposed changes associated with the Scheme the natural character values of all river and stream reaches affected by the Scheme will remain at their present level i.e. moderate to moderate-high , apart from the Mangaotea Stream where the values are considered to be low and will remain at this level. The additional water take from the Manganui River will result in a mean monthly average reduction in the flow of 0.63 m^3/s immediately downstream of the weir and a 0.44 m^3/s increase in flow from the Motukawa Power Station into the Makara Stream. This is expected to result in no more than minor adverse effects on water quality (including nutrients, clarity and faecal bacteria), water temperature, and the aquatic flora and fauna in both rivers with the mitigation measures proposed.[44]

With the continued operation of the Scheme, and the proposed additional take from the Manganui River (a potential maximum increase of 2.3 m^3/s) as outlined in Section 3.3 above, the modification to the natural character attributes of the Manganui River, Mangaotea Stream, Mako Stream, Makara Stream and Waitara River and their margins will remain broadly as it has been in the past apart from natural variations due largely to climatic conditions. In this regard, the natural character values for each river reach will remain broadly as described in Section 5.3 and 5.4 above. This includes the experiential values along the Manganui River where the existing attributes and qualities associated with the character of the riverbed, its margins and the broad pattern of water flows will be maintained.

With the proposed changes and ongoing operation of the Scheme, in conjunction with the existing and proposed conditions of consent, the effects on the existing natural character values will vary within each river and stream reach as follows:

- Manganui River - Reach 1 and 2 - above the weir and intake, the river is not affected by the Scheme and the ongoing effects will be **Neutral** for River Reach's 1 and 2.
- Mangaotea Stream - Reach 3 - the ongoing effects are associated with the aqueduct, and water take into the Motukawa Race. This will continue to have **Low** (less than minor) adverse natural character effects on the Mangaotea Stream.

[44] Motukawa Hydroelectric Power Scheme –Acquatic Ecology Assessment of Effects – prepared by Ryder Environmental (November 2021)

- Manganui River - Reach 4 - the primary ongoing effect is the reduced flow rate in the river, as well as the weir, fish passage and intake structures. This will continue to generate **Moderate-Low** (i.e. minor) adverse effects on the natural character values on this 20 km length of river.
- Waitara River - Reach 5 – between the confluences with the Makara Stream and Makino Stream, the Waitara River flow is affected by the small reduction in water flow from the Mako Stream, however beyond that (upstream) and for the majority of this reach there is no change to the water flow. This reduction in flow rate will continue to generate **Very Low** adverse ongoing effects.
- Mako Stream from Lake Ratapiko to Makino Stream - Reach 6 – the damming and loss of water flow in the very upper reaches of the stream will continue to generate **Moderate-Low** (i.e. minor) adverse ongoing natural character effects.
- Makara Stream Reach 7 – with the additional inflows to this stream from the Motukawa Power Station the ongoing adverse natural character effects will be **Low** (i.e. less than minor).
- Waitara River: Makara Stream confluence to Manganui River –Reach 8 - the additional flow from the Makara Stream in the Waitara River to the Manganui River will result in **Very Low** (less than minor) adverse effects.
- Waitara River: Manganui River to Tasman Sea – Reach 9 – with all water returned to the river for this reach the ongoing effects will be **Neutral.**

6.2 Summary of Natural Character Effects by Reach

River and Stream Reach Name	Natural Character Effects
Manganui River Catchment	
Reach 1 – Manganui River: Egmont National Park	Neutral
Reach 2 - Manganui River: National Park to Tariki Road South	Neutral
Reach 3 - Mangaotea Stream	Low
Reach 4 – Manganui River: Tariki South Road to Waitara River	Moderate-Low (Minor)
Waitara River Catchment	
Reach 5 – Waitara River: above Makara Stream	Neutral
Reach 6 – Mako Stream: Lake Ratapiko to Makino Stream	Moderate-Low (Minor)
Reach 7 – Makara Stream: to Waitara River	Low
Reach 8 – Waitara River: Makara Stream to Manganui River	Very Low
Reach 9 – Waitara River: Manganui River to Tasman Sea	Neutral

There will continue to be specific adverse natural character effects resulting from the Motukawa HEPS weir and intake structures and associated reduced water flows on various reaches of the Manganui River which range from neutral to moderate - low (i.e. minor). When considering the whole length of the river and its catchment streams, 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 is considered to be moderate-low (minor), however the overall adverse effects on the other streams and the river are considered to be low (less than minor).

6.3 Landscape Character and Visual Amenity Effects

6.3.1 Manganui River Diversion

At the Manganui River diversion, the weir and associated structures are located in a landscape setting which contains the river and riparian vegetation, and farm buildings, fences and pastoral grazing areas that are not associated with the Scheme. Much of the land surrounding the Scheme is owned and managed by Trustpower and as such it is not accessible to the public, although glimpse oblique views towards the Motukawa Race are afforded from Tariki Road South. Most of the various components of Scheme in this area have been in place for over 90 years and have become a recognised part of the local landscape. Given that the only change to the Scheme in this area is the additional water take from the river to the Motukawa Race and that the existing weir, fish passage and other structures are to remain it is considered that adverse landscape and visual amenity effects of the scheme in the immediate area surrounding the weir will be moderate-low (minor).

6.3.2 Motukawa Race and Silt Pond

The 5 km long Motukawa Race is a linear element located within a flat to gently rolling part of the Ring Plain adjacent to and often crossing a number of other linear elements such as public roads, farm tracks, fencelines, and shelter belts. While the race may be visible in some locations from nearby roads and crossings, due to its flat nature and finished level alongside the surrounding landform, it is not particularly noticeable. The race will continue to be used for the transfer of water from the Manganui River to Lake Ratapiko, albeit at a slightly greater volume and therefore maximum level. The existing Silt Pond will remain and continue to be dredged of sediment periodically. The existing Tariki Road weir and above ground structures associated with the in-race generator and Mangaotea Stream aqueduct will remain in place. Even though this part of the Scheme is somewhat more visible from public road locations it has also been in place for over 90 years and has become part of the rural landscape character. As such it is considered that the continued operation of this part of the Scheme in line with its current character will result in **very low** (less than minor) adverse landscape and visual amenity effects.

6.3.3 Lake Ratapiko

The main ongoing physical landscape effects resulting from the Scheme relate to the tunnel water intake structure, dam and spillways within the margins of the lake, the managed variability in the lake level, and periodic lowering of the lake for weed and sediment removal. The structures have become well integrated into the character of the lake surrounds and the visible changes to the lake levels are a recognised fluctuation much like a tidal variation.

The introduction of the Scheme and the associated creation of Lake Ratapiko over 90 years ago has created an environment with a range of recreation and visual amenity values, both within the lake and around its accessible margins. Here the public can enjoy a range of active and passive recreational pursuits and enjoy the scenic nature and experience of this water body. These artificial landscapes have a range of qualities associated with water and vegetation that enhance the visual amenity of the surrounds and the experience of the general public. The proposed operating regime of the Scheme will not affect the minimum and maximum levels of

the lake and it will be broadly maintained in its current state. While there will continue to be ongoing sediment removal from the upper western arm of the lake near the inflow from the Motukawa Race, this occurs for a short duration and is managed to minimise any impact on the pleasure and enjoyment of lake users. As such there will be no further changes to the landscape qualities and character of the lake and these attributes will be able to continue to be enjoyed. On balance it is considered the Scheme has enhanced the visual amenity of the rural farmland where Lake Ratapiko is located by way of making this area more accessible and available for leisure pursuits. This has resulted in beneficial landscape character effects and enhanced amenity for the users and residents of the area, which will continue with the operation of the Scheme.

6.3.4 Power Station and Surrounds

The Motukawa Power Station, penstocks and tailrace which are located at the western end of the Scheme within the Frontal Hill Country landscape unit (south of the Waitara River adjacent to Motukawa Road) have become an established part of the landscape character of the rural landscape set within the foothills of the river catchment. The area is characterised by areas of indigenous bush around the surge chamber and upper extent of the penstock, and around the Makara Stream margins and the boundary of the Trustpower land. The tailrace extends from the power station in a discretely located channel / culvert under the site access road to the Makara Stream. The above ground penstock pipe which extends for approximately 1.6km from the surge chamber to the powerhouse over a fall of approximately 80m, creates a linear infrastructure element which modifies the hill slope above the Motukawa Power Station. While this is an element that is obvious and prominent from nearby locations, it is not visible from beyond the immediate surrounds and does not alter the rural character of the wider area. The power station and associated buildings are now well integrated into the immediate site surrounds with vegetation screening this from the road and surrounding farms and dwellings. Based on this, the power station and associated structures result in no more than **low** (less than minor) adverse effects on the landscape character and visual amenity of the area.

6.3.5 Landscape and Visual Amenity Effects Summary

In summary, the implementation of the Scheme has resulted in modification to the physical landscape and character within part of the ring plain and frontal hill country landscape units of the Manganui and Waitara awa. These changes are characterised by the 21 ha Lake Ratapiko and associated public open space, as well as in-stream and lake structures, tunnels, above ground pipes, a water race and buildings. The elements and the ongoing effects generated by their scale and form are overall considered to be less than minor, with any adverse effects of the in-stream, power station and lake structures compensated for by the landscape quality and character of the lake and its wide public use and enjoyment.

7.0 Evaluation in Relation to Statutory Provisions

The relevant landscape, natural character and visual amenity provisions as outlined in Section 4 above are summarised and commented on below in relation to the proposed reconsenting of the Scheme.

7.1 National Policy Statement for Freshwater Management

Policy 7 of the NPS FM provides that the loss of river extent and values is avoided to the extent practicable. As part of the approach to implementing the NPS FM, clause 3.24 - Rivers requires TRC to amend its regional plan to include a policy providing that the loss of river extent and values is avoided unless the council is satisfied that there is functional need for the activity in that location and the effects of the activity are managed by applying the effects management hierarchy. As noted earlier, TRC has amended the Regional Plan accordingly.

Loss of value is defined in the NPS FM to mean that the river is less able to provide for any value identified under the NOF process, or any of the 5 listed values listed in the NPS FM which includes amenity. While the AEE addresses the effects management hierarchy in detail, amenity is considered below in the context of the NPS FM.

7.1.1 Effects on Amenity Values

Section 6.3 of this report assesses the landscape and visual amenity effects of the existing Scheme and concludes that the effects on landscape and visual amenity values of the Manganui River in the area immediately surrounding the weir are **moderate-low** (or minor). This level of effect is due to the structures and associated reduction in water flow in the river surrounding and immediately downstream of the weir, intake and fish passage.

Although immediately downstream of the weir and intake, the minimum flows in summer are on average 2.80 m^3/s, this area of the river is not accessible to the public and while the reduced river flows do affect the natural character and landscape values for a short section below the weir, the visual amenity values associated with the water and vegetated margins remain as a positive element in the landscape.

When considered in relation to the approximate 25km river reach from Tariki Road to the Waitara River the visual amenity effects are considered to be low or less than minor due to the increase in river flows through tributary inflows, the margin character and landscape context, and the observable river flows downstream at river crossings and at Everett Park.

At the Everett Park Scenic Reserve, the public are able to obtain views of the river. While regular visitors may notice these changes and consider that the visual amenity of the reserve and river to be adversely affected, from personal observation of the river in February when the water flow was 4.94 m^3/s, the visual amenity of the river and reserve remained high. This was due to the width of the riverbed, sound of water over the stony bed, the water clarity, rocky bottom, vegetated margins, and natural indigenous bush setting. At times and when the river contains a higher volume of water, the flow could be noticeably greater and more dramatic, however, this does not mean the lower flows are without amenity value. Rather the visual amenity associated with the river environment contains a different combination of characteristics associated with the same elements i.e. lower flows allow more of the margin and stony riverbed to be visible and accessible, while at higher flows these elements would be obscured.

The use of the Manganui River for angling and kayaking is generally restricted to locations well downstream of the weir where public access is available i.e. Everett Park Scenic Reserve some 15 km below the weir. Fish passage will be maintained to upstream areas of the river, and during high river flows and freshes, kayakers will continue to be able to utilise the river at the existing get-in locations, the closest being 11km downstream of the weir. The anticipated reduction of water flow immediately below the weir will not have any effect on the recreational uses which occur further down the river where higher additional flows occur through tributaries along this reach to the Waitara River.

Overall, the anticipated reduction of water flow immediately below the weir is considered to have a less than minor adverse effect on the visual amenity of the Manganui River reach to the

Waitara River. Similarly, any adverse effects resulting from the existing outfalls from the Motukawa Power Station and any increase resulting from the take, via the race, will also have a less than minor adverse effect on the visual amenity values of the Makara Stream and Waitara River.

A number of technical assessments have made recommendations which will relate to amenity associated with the rivers which are included in proposed conditions of consent. These focus on the continuation of residual flows and artificial freshes to maintain water temperature and macroinvertebrate community health, and minimise periphyton growth, thereby maintaining water clarity and quality in the Manganui River. With these and similar measures for other parts of the Scheme the amenity values associated with the rivers and streams will be able to continue to provide for the existing natural character, landscape and visual amenity values.

7.2 Regional and District Plan Provisions

7.2.1 Protection of Natural Character, Natural Features and Landscapes of Regional Significance

The Manganui River and middle reaches of the Waitara River have been identified as rivers of regional significance, notwithstanding the presence of the Scheme, with its range of characteristics and effects associated with its development and ongoing operation which results in various degrees of modification. In terms of natural character and landscape effects the modification to these values were largely generated when the Scheme was constructed. The ongoing use, along with the proposed increase in water take from the Manganui River, operating within a suite of existing and proposed additional conditions will maintain the existing natural character values of the rivers, streams and their margins within the Waitara catchment.

7.2.2 Recognition and Management of Valued Natural Areas

The natural values associated with the rivers and Lake Ratapiko include geomorphological, water quality and quantity, botanical, wildlife and fishery values, natural character, and amenity. In combination these contribute to biodiversity and the functioning of ecosystems.

The major effects on natural character and visual amenity resulting from the Scheme are associated with the weir and intake to the Motukawa Race, and the creation of Lake Ratapiko. While the proposed additional water take will have some periodic effect on natural character and visual amenity values immediately downstream of the weir, these will be to a less than minor degree. The ongoing management of the Scheme in accordance with the conditions of consent will maintain the same level of effects on the landscape and natural character values identified and continue to provide benefits at Lake Ratapiko in terms of landscape quality and visual amenity.

7.2.3 Avoidance, Remediation or Mitigation of Adverse Effects on Amenity Values

As outlined above the proposed additional water take is not considered to reduce the amenity values at Everett Park Scenic Reserve or Lake Ratapiko, and these publicly accessible areas affected by the Scheme will continue to provide scenic, aesthetic and recreational opportunities. The continued use of Lake Ratapiko for these sorts of benefits provides positive effects to balance those adverse effects that may result from reduced water flows downstream of the weir in the Manganui River.

8.0 Summary / Conclusion

The existing consents for the operation of the Motukawa HEPS are due to expire on 1 June 2022. This report is one of a series of technical reports that have been prepared to support an application to renew these consents. In summary the Scheme diverts water from the Manganui River to the Motukawa Power Station via a water race (Motukawa Race), storage lake (Lake Ratapiko), tunnel and penstocks, discharging into the Makara Stream and then the Waitara River.

This natural character, landscape and visual assessment report:

(i) describes the regional landscape context of Manganui River and Waitara River catchments;

(ii) describes the key elements and changes to the landscape resulting from the Scheme;

(iii) outlines the relevant statutory provisions and strategies for managing the rivers;

(iv) assesses the existing landscape and natural character attributes and values of the water bodies;

(v) analyses the natural character, landscape and visual amenity effects resulting from the existing Scheme and proposed changes to its operation; and

(vi) evaluates these effects in relation to the relevant statutory provisions.

The main points arising from this assessment are:

Landscape and Statutory Context

Apart from the upper reaches of the Manganui River which are located on the upper flanks of Mt Taranaki within the Egmont National Park, the balance of the catchments which are affected by the Scheme have been modified through clearance of indigenous forest, farming and settlement. However, Mt Taranaki and some of its Ring Plain waterways have retained high natural and amenity values are of cultural and spiritual significance to mana whenua.

The Manganui River (and a section of the Waitara River downstream of the confluence with Manganui) have been recognised as a high value water bodies with high natural, ecological and amenity values with the upper reaches considered to be an Outstanding Freshwater Body in the Taranaki Regional Freshwater Plan. This recognition is reflected in the New Plymouth District Plan, along with the artificially created Lake Ratapiko. In addition, Everett Park Scenic Reserve, located adjacent to a stretch of the left bank along the lower reach of the Manganui River is identified as being one of the best remaining remnants of lowland forest in the region. This park is also of important to Te Atiawa and has statutory acknowledgement in the freshwater plan.

Key Elements of the Scheme

(i) The diversion and abstraction of water from the Manganui River to the Motukawa Race and the resultant reduction in river flows downstream;

(ii) The occupation and maintenance of a diversion weir, associated intake, and fish passes in the Manganui River;

(iii) The ongoing use and maintenance of the 4.6km long Motukawa Race, including two short tunnels, a race generator, and aqueduct at the Mangaotea Stream;

(iv) The continued damming of the Mako Stream via a 12 m earth dam structure to form the 21 ha Lake Ratapiko and ongoing maintenance and sediment control in the lake;

(v) The abstraction of water from Lake Ratapiko and via an intake structure, tunnel, surge chamber and penstocks for the purposes of electricity generation at the Motukawa Power Station;

(vi) The management of lake levels to avoid or minimise flooding of surrounding land to a maximum level of 198.7 m asl, and a minimum level of 194 m asl except during periods of maintenance;

(vii) The discharge of water from Lake Ratapiko (during adverse weather conditions) via spillways to the Mako Stream; and

(viii) The discharge of water to the Makara Stream via a tailrace from the Motukawa Power Station.

Existing Natural Character, Landscape and Amenity Attributes and Values

Sections of both the Manganui and Waitara River have high natural character values associated with the unmodified instream morphology, water quality, habitat and terrestrial vegetation within the margins. However, the surrounding landscape context is largely modified through pastoral farming and some forestry landuse which lowers the overall natural character values and landscape quality of these waterbodies.

Recreational use is largely limited to the upper reaches of the Manganui (within the national park) and lower sections of the Manganui and Waitara Rivers when flows allow for kayaking and rafting. These areas as well as Lake Ratapiko also provide for recreational fishing. Lake Ratapiko also supports a water ski club and a jet boating with part of the lake available to the public. As well as having natural and ecological values associated with the indigenous forest Everett Park provides one of the few publicly accessible river access locations.

Other locations where the public can interact with the Manganui and Waitara Rivers are restricted to road bridge crossings, with the balance of the river reaches and their tributaries set within private land holdings. Two Marae are located on the banks adjacent to the middle and lower sections of the Waitara River and one of these (Pukerangiora Pa) is a historic reserve providing access for Ngāti Maru, Pukerangiora hapu and Te Ātiawa iwi.

The natural character assessment values for the Manganui River have been assessed by river reach and range from very high within the Egmont National Park, to high between the park and Tariki Road South (just upstream of the Trustpower weir) to moderate for the balance of the river to the Waitara confluence and low for the Mangaotea Stream tributary. For the Waitara River the values have been assessed as ranging between moderate for reaches upstream of the Power Station and below the Manganui River and moderate-high between the Power Station and the Manganui River.

Natural Character, Landscape and Visual Amenity Effects

There will continue to be specific adverse natural character effects resulting from the Motukawa HEPS weir and intake structures and associated reduced water flows on various reaches of the Manganui River which range from neutral to moderate - low (i.e. minor). When considering the whole length of the river and its catchment streams, 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 river are considered to be low (less than minor).

The additional water take from the Manganui River is expected to result in no more than minor adverse effects on water quality (including nutrients, clarity and faecal bacteria), water temperature, and the aquatic flora and fauna in both rivers with the mitigation measures proposed. With these proposed changes associated with the Scheme the natural character

values of all river and stream reaches affected by the Scheme will remain at their present level i.e. moderate to moderate-high , apart from the Mangaotea Stream where the values are considered to be low and will remain at this level.

In relation to landscape and visual amenity effects the implementation of the Scheme has resulted in modification to the physical landscape and character of the area. These changes are characterised by the 21 ha Lake Ratapiko and associated public open space, as well as in-stream and lake structures, tunnels, above ground pipes, a water race and buildings. The elements and the ongoing landscape and visual amenity effects generated by their scale and form are overall considered to be less than minor, with any adverse effects of the in-stream, power station and lake structures offset by the landscape quality and character of the lake and its wide public use and enjoyment.

Statutory Provisions

In relation to the Policy 7 of the NPS FM the ongoing operation and the anticipated reduction of water flow immediately below the weir is considered to have a less than a minor adverse effect on the visual amenity of the Manganui River reach to the Waitara River. Similarly, any adverse effects resulting from the existing outfalls from the Motukawa Power Station and any increase resulting from the take, via the race, will have a less than minor adverse effect on the visual amenity values of the Makara Stream and Waitara River.

A number of technical assessments have made recommendations which relate to the amenity associated with the rivers which are included in proposed conditions of consent. These focus on the continuation of residual flows and artificial freshes to maintain water temperature and macroinvertebrate community health, and minimise periphyton growth, thereby maintaining water clarity and quality in the Manganui River. With these and similar measures for other parts of the Scheme the amenity values associated with the rivers and streams will be able to continue to provide for the existing natural character, landscape and visual amenity values.

Furthermore, the proposed additional water take is not considered to reduce the amenity values at Everett Park Scenic Reserve or Lake Ratapiko, and these publicly accessible areas affected by the Scheme will continue to provide scenic, aesthetic and recreational opportunities. The continued use of Lake Ratapiko for these sorts of benefits provides positive effects as a result of the Scheme.

List of References

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2. https://www.qualityplanning.org.nz/index.php/node/805

3. RMAct - Section 6(a)) considers natural character as a matter of national importance: …the preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development

4. The Scheme is not located in the coastal environment and is not subject to the NZCPS

5. Harrison v Tasman DC [1994] NZRMA 193 (PT); Trio Holdings v Marlborough DC W103A/96(PT),

6. NZCPS 2010 Guidance note Policy 13: Preservation of natural character

7. Resource Management Act Section 7c

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14. Hydrology Report Table 3.8 Page 73

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20. NPS – FW Part 1.3 (1)

21. RPS - NFL OBJECTIVE 1, NFL POLICY 3

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24. Regional Plan - OBJ 3.1.3

25. Regional Plan - OBJ 3.1.2, OBJ 3.1.5, POL 3.3.1

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27. Regional Plan – OBJ 3.2.1

28. RPS Appendix 1: Rivers and stream catchments of high quality or high value for their natural, ecological and amenity values

29. Regional Plan Appendix 1A: Rivers and stream catchments with high natural, ecological and amenity values

30. Freshwater bodies of outstanding or significant value in the Taranaki Region

31. Regional Plan Appendix 1A: Rivers and stream catchments with high natural, ecological and amenity values

32. Appendix X- Regional Fresh Water Plan Statutory Acknowledgements – Appendix XH: Te Atiawa statutory acknowledgements

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

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

35. Regional Plan Appendix 1A: Rivers and stream catchments with high natural, ecological and amenity values

36. Recreation Report – Para 3.2

37. Recreation Report Section 2.2 and Figure 3

38. Aquatic Ecology report, Page 17

39. Aquatic Ecology report Page 17

40. Aquatic Ecology Report – Page 44

41. Aquatic Ecology Report – Page 20

42. Aquatic Ecology Report – Page 20

43. Aquatic Ecology Report – Page 36

44. Motukawa Hydroelectric Power Scheme –Acquatic Ecology Assessment of Effects – prepared by Ryder Environmental (November 2021)

APPENDIX 1:
Natural Character, Landscape and Visual Assessment Methodology – Updated November 2021

Introduction

The Natural Character, Landscape and Visual Effects Assessment (NCLVEA) process provides a framework for assessing and identifying the nature and level of likely effects that may result from a proposed development. Such effects can occur in relation to changes to physical elements, changes in the existing character or condition of the landscape and the associated experiences of such change. In addition, the landscape assessment method may include (where appropriate) an iterative design development processes, which seeks to avoid, remedy or mitigate adverse effects (see **Figure 1**).

This outline of the landscape and visual effects assessment methodology has been undertaken with reference to the **Draft Te Tangi A Te Manu: Aotearoa New Zealand Landscape Assessment Guidelines** and its signposts to examples of best practice, which include the **Quality Planning Landscape Guidance Note**[1] and the **UK guidelines for landscape and visual impact assessment[2].**

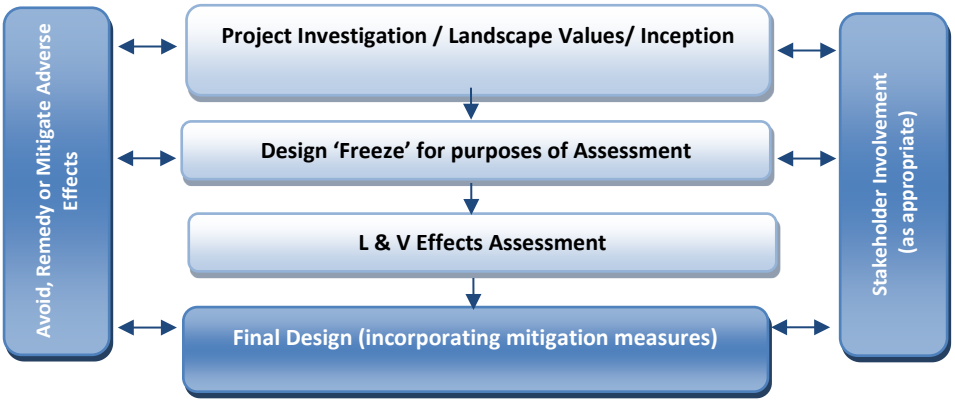


Figure 1: Design feedback loop

When undertaking any landscape assessment, it is important that a **structured and consistent approach** is used to ensure that **findings are clear and objective**. Judgement should be based on skills and experience and be supported by explicit evidence and reasoned argument.

While natural character, landscape and visual effects assessments are closely related, they form separate procedures. Natural character effects consider the characteristics and qualities and associated degree of modification relating specifically to waterbodies and their margins, including the coastal environment. The assessment of the potential effects on landscape considers effects on landscape character and values. The assessment of visual effects considers how changes to the physical landscape affect the viewing audience. The types of effects can be summarised as follows:

Natural Character effects: *Change in the characteristics or qualities including the level of naturalness.*

Landscape effects: *Change in the physical landscape, which may affect its characteristics or values*

Visual effects: *Change to views which may affect the visual amenity experienced by people*

[1] http://www.qualityplanning.org.nz/index.php/planning-tools/land/landscape
[2] Landscape Institute and Institute of Environmental Management and Assessment (2013) Guidelines for Landscape and Visual Impact Assessment, 3rd Edition (GLVIA3)

The policy context, existing landscape resource and locations from which a development or change is visible, all inform the 'baseline' for landscape and visual effects assessments. To assess effects, the first step requires identification of the landscape's **character** and **values** including the **attributes** on which such values depend. This requires that the landscape is first **described**, including an understanding of relevant physical, sensory and associative landscape dimensions. This process, known as landscape characterisation, is the basic tool for understanding landscape character and may involve subdividing the landscape into character areas or types. The condition of the landscape (i.e. the state of an individual area of landscape or landscape feature) should also be described together with, a judgement made on the value or importance of the potentially affected landscape.

Natural Character Effects

In terms of the RMA, natural character specifically relates to the coastal environment as well as freshwater bodies and their margins. The RMA provides no definition of natural character. RMA, section 6(a) considers natural character as a matter of national importance:

> *…the preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development.*

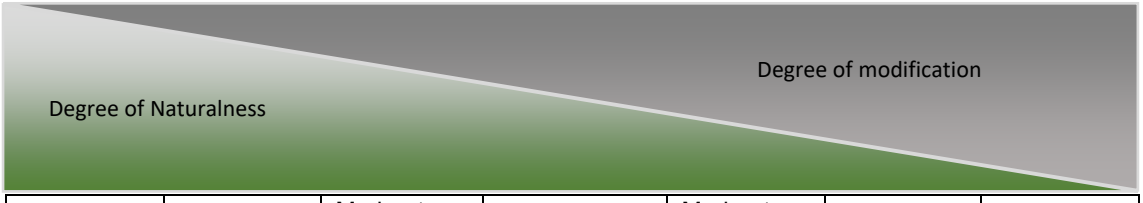
Natural character comprises the natural elements, patterns and processes of the coastal environment, waterbodies and their margins, and how they are perceived and experienced. This assessment interprets natural character as being the degree of naturalness consistent with the following definition:

> *Natural character is a term used to describe the naturalness of waterbodies and their margins. The degree or level of natural character depends on:*
>
> - *The extent to which natural elements, patterns and processes occur;*
> - *The nature and extent of modifications to the ecosystems and landscape/seascape;*
> - *The highest degree of natural character (greatest naturalness) occurs where there is least modification; and*
> - *The effect of different types of modification upon the natural character of an area varies with the context and may be perceived differently by different parts of the community.*

The process to assess natural character involves an understanding of the many systems and attributes that contribute to waterbodies and their margins, including biophysical and experiential factors. This can be supported through the input of technical disciplines such as marine, aquatic and terrestrial ecology, and landscape architecture.

Defining the level of natural character

The level of natural character is assessed in relation to a seven-point scale. The diagram below illustrates the relationship between the degree of naturalness and degree of modification. A high level of natural character means the waterbody is less modified and vice versa.



Very High	High	Moderate - High	Moderate	Moderate - Low	Low	Very Low

Scale of assessment

When defining levels of natural character, it is important to clearly identify the spatial scale considered. The scale at which natural character is assessed will typically depend on the study area or likely impacts and nature of a proposed development. Within a district or region-wide study, assessment scales may be divided into broader areas which consider an overall section of coastline or river with similar characteristics, and finer more detailed 'component' scales considering separate more local parts, such as specific bays, reaches or escarpments. The

assessment of natural character effects has therefore considered the change to attributes which indicate levels of natural character at a defined scale.

Effects on Natural Character

An assessment of the effects on natural character of an activity involves consideration of the proposed changes to the current condition compared to the existing. This can be negative or positive.

The natural character effects assessment involves the following steps;

- assessing the existing level of natural character;
- assessing the level of natural character anticipated (post construction); and
- considering the significance of the change

Landscape Effects

Assessing landscape effects requires an understanding of the landscape resource and the magnitude of change which results from a proposed activity to determine the overall level of landscape effects.

Landscape Resource

Assessing the sensitivity of the landscape resource considers the key characteristics and qualities. This involves an understanding of both the ability of an area of landscape to absorb change and the value of the landscape.

Ability of an area to absorb change

This will vary upon the following factors:

- Physical elements such as topography / hydrology / soils / vegetation;
- Existing land use;
- The pattern and scale of the landscape;
- Visual enclosure / openness of views and distribution of the viewing audience;
- The zoning of the land and its associated anticipated level of development;
- The scope for mitigation, appropriate to the existing landscape.

The ability of an area of landscape to absorb change takes account of both the attributes of the receiving environment and the characteristics of the proposed development. It considers the ability of a specific type of change occurring without generating adverse effects and/or achievement of landscape planning policies and strategies.

The value of the Landscape

Landscape value derives from the importance that people and communities, including tangata whenua, attach to particular landscapes and landscape attributes. This may include the classification of Outstanding Natural Feature or Landscape (ONFL) (RMA s.6(b)) based on important physical, sensory and associative landscape attributes, which have potential to be affected by a proposed development. A landscape can have value even if it is not recognised as being an ONFL.

Magnitude of Landscape Change

The magnitude of landscape change judges the amount of change that is likely to occur to areas of landscape, landscape features, or key landscape attributes. In undertaking this assessment, it is important that the size or scale of the change is considered within the geographical extent of the area influenced and the duration of change, including whether the change is reversible. In some situations, the loss /change or enhancement to existing landscape elements such as vegetation or earthworks should also be quantified.

When assessing the level of landscape effects, it is important to be clear about what factors have been considered when making professional judgements. This can include consideration of any benefits which result from a proposed development. **Table 1** below helps to explain this process. The tabulating of effects is only intended to inform overall judgements.

Contributing Factors		Higher	Lower
Landscape (sensitivity)	**Ability to absorb change**	The landscape context has limited existing landscape detractors which make it highly vulnerable to the type of change resulting from the proposed development.	The landscape context has many detractors and can easily accommodate the proposed development without undue consequences to landscape character.
	The value of the landscape	The landscape includes important biophysical, sensory and shared and recognised attributes. The landscape requires protection as a matter of national importance (ONF/L).	The landscape lacks any important biophysical, sensory or shared and recognised attributes. The landscape is of low or local importance.
Magnitude of Change	**Size or scale**	Total loss or addition of key features or elements. Major changes in the key characteristics of the landscape, including significant aesthetic or perceptual elements.	The majority of key features or elements are retained. Key characteristics of the landscape remain intact with limited aesthetic or perceptual change apparent.
	Geographical extent	Wider landscape scale.	Site scale, immediate setting.
	Duration and reversibility	Permanent. Long term (over 10 years).	Reversible. Short Term (0-5 years).

Table 1: Determining the level of landscape effects

Visual Effects

To assess the visual effects of a proposed development on a landscape, a visual baseline must first be defined. The visual 'baseline' forms a technical exercise which identifies the area where the development may be visible, the potential viewing audience, and the key representative public viewpoints from which visual effects are assessed.

Field work is used to determine the actual extent of visibility of the site, including the selection of representative viewpoints from public areas. This stage is also used to identify the potential 'viewing audience' e.g. residential, visitors, recreation users, and other groups of viewers who can see the site. During fieldwork, photographs are taken to represent views from available viewing audiences.

The viewing audience comprises the individuals or groups of people occupying or using the properties, roads, footpaths and public open spaces that lie within the visual envelope or 'zone of theoretical visibility (ZTV)' of the site and proposal. Where possible, computer modelling can assist to determine the theoretical extent of visibility together with field work to confirm this. Where appropriate, key representative viewpoints should be agreed with the relevant local authority.

The Sensitivity of the viewing audience

The sensitivity of the viewing audience is assessed in terms of assessing the likely response of the viewing audience to change and understanding the value attached to views.

Likely response of the viewing audience to change

Appraising the likely response of the viewing audience to change is determined by assessing the occupation or activity of people experiencing the view at particular locations and the extent to which their interest or activity may be focussed on views of the surrounding landscape. This relies on a landscape architect's judgement in respect of visual amenity and the reaction of people who may be affected by a proposal. This should also recognise that people more susceptible to change generally include: residents at home, people engaged in outdoor recreation whose attention or interest is likely to be focussed on the landscape and on particular views; visitors to heritage assets or other important visitor attractions; and communities where views contribute to the wider landscape setting.

Value attached to views

The value or importance attached to particular views may be determined with respect to its popularity or numbers of people affected or reference to planning instruments such as viewshafts or view corridors. Important viewpoints are also likely to appear in guide books or tourist maps and may include facilities provided for its enjoyment. There may also be references to this in literature or art, which also acknowledge a level of recognition and importance.

Magnitude of Visual Change

The assessment of visual effects also considers the potential magnitude of change which will result from views of a proposed development. This takes account of the size or scale of the effect, the geographical extent of views and the duration of visual change, which may distinguish between temporary (often associated with construction)

and permanent effects where relevant. Preparation of any simulations of visual change to assist this process should be guided by best practice as identified by the NZILA[3].

When determining the overall level of visual effect, the nature of the viewing audience is considered together with the magnitude of change resulting from the proposed development. **Table 4** has been prepared to help guide this process:

Contributing Factors		Higher	Lower	Examples
The Viewing Audience (sensitivity)	**Ability to absorb change**	Views from dwellings and recreation areas where attention is typically focussed on the landscape.	Views from places of employment and other places where the focus is typically incidental to its landscape context. Views from transport corridors.	Dwellings, places of work, transport corridors, public tracks
	Value attached to views	Viewpoint is recognised by the community such as an important view shaft, identification on tourist maps or in art and literature. High visitor numbers.	Viewpoint is not typically recognised or valued by the community. Infrequent visitor numbers.	Acknowledged viewshafts, Lookouts
Magnitude of Change	**Size or scale**	Loss or addition of key features in the view. High degree of contrast with existing landscape elements (i.e. in terms of form scale, mass, line, height, colour and texture). Full view of the proposed development.	Most key features of views retained. Low degree of contrast with existing landscape elements (i.e. in terms of form scale, mass, line, height, colour and texture. Glimpse / no view of the proposed development.	- Higher contrast/ Lower contrast. - Open views, Partial views, Glimpse views (or filtered); No views (or obscured)
	Geographical extent	Front on views. Near distance views; Change visible across a wide area.	Oblique views. Long distance views. Small portion of change visible.	- Front or Oblique views. - Near distant, Middle distant and Long distant views
	Duration and reversibility	Permanent. Long term (over 15 years).	Transient / temporary. Short Term (0-5 years).	- Permanent (fixed), Transitory (moving)

Table 2: Determining the level of visual effects

Nature of Effects

In combination with assessing the level of effects, the landscape and visual effects assessment also considers the nature of effects in terms of whether this will be positive (beneficial) or negative (adverse) in the context within which it occurs. Neutral effects can also occur where landscape or visual change is benign.

It should also be noted that a change in a landscape does not, of itself, necessarily constitute an adverse landscape or visual effect. Landscape is dynamic and is constantly changing over time in both subtle and more dramatic transformational ways; these changes are both natural and human induced. What is important in managing landscape change is that adverse effects are avoided or sufficiently mitigated to ameliorate the effects of the change in land use. The aim is to provide a high amenity environment through appropriate design outcomes.

This assessment of the nature effects can be further guided by **Table 2** set out below:

Nature of effect	Use and Definition
Adverse (negative):	The activity would be out of scale with the landscape or at odds with the local pattern and landform which results in a reduction in landscape and / or visual amenity values
Neutral (benign):	The activity would be consistent with (or blend in with) the scale, landform and pattern of the landscape maintaining existing landscape and / or visual amenity values
Beneficial (positive):	The activity would enhance the landscape and / or visual amenity through removal or restoration of existing degraded landscape activities and / or addition of positive elements or features

Table 1: Determining the Nature of Effects

[3] Best Practice Guide: Visual Simulations BPG 10.2, NZILA

Cumulative Effects

This can include effects of the same type of development (e.g. bridges) or the combined effect of all past, present and approved future development[4] of varying types, taking account of both the permitted baseline and receiving environment. Cumulative effects can also be positive, negative or benign.

Cumulative Landscape Effects

Cumulative landscape effects can include additional or combined changes in components of the landscape and changes in the overall landscape character. The extent within which cumulative landscape effects are assessed can cover the entire landscape character area within which the proposal is located, or alternatively, the zone of visual influence from which the proposal can be observed.

Cumulative Visual Effects

Cumulative visual effects can occur in combination (seen together in the same view), in succession (where the observer needs to turn their head) or sequentially (with a time lapse between instances where proposals are visible when moving through a landscape). Further visualisations may be required to indicate the change in view compared with the appearance of the project on its own.

Determining the nature and level of cumulative landscape and visual effects should adopt the same approach as the project assessment in describing both the nature of the viewing audience and magnitude of change leading to a final judgement. Mitigation may require broader consideration which may extend beyond the geographical extent of the project being assessed.

Determining the Overall Level of Effects

The landscape and visual effects assessment conclude with an overall assessment of the likely level of landscape and visual effects. This step also takes account of the nature of effects and the effectiveness of any proposed mitigation. The process can be illustrated in Figure 2:

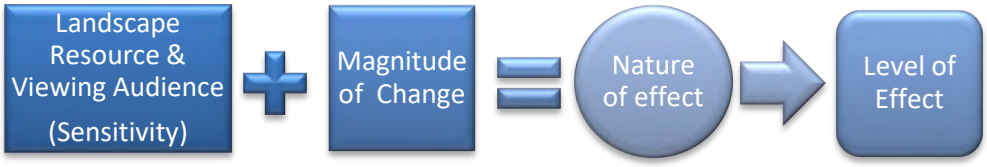


Figure 2: Assessment process

This step informs an overall judgement identifying what level of effects are likely to be generated as indicated in **Table 3** below. This table which can be used to guide the level of natural character, landscape and visual effects uses an adapted seven-point scale derived from Te Tangi A Te Manu.

Effect Rating	Use and Definition
Very High:	Total loss of key elements / features / characteristics, i.e. amounts to a complete change of landscape character and in views.
High:	Major modification or loss of most key elements / features / characteristics, i.e. little of the pre-development landscape character remains and a major change in views. *Concise Oxford English Dictionary Definition* *High: adjective- Great in amount, value, size, or intensity.*
Moderate- High:	Modifications of several key elements / features / characteristics of the baseline, i.e. the pre-development landscape character remains evident but materially changed and prominent in views.

[4] The life of the statutory planning document or unimplemented resource consents.

Moderate:	Partial loss of or modification to key elements / features / characteristics of the baseline, i.e. new elements may be prominent in views but not necessarily uncharacteristic within the receiving landscape. *Concise Oxford English Dictionary Definition* *Moderate: adjective- average in amount, intensity, quality or degree*
Moderate - Low:	Minor loss of or modification to one or more key elements / features / characteristics, i.e. new elements are not prominent within views or uncharacteristic within the receiving landscape.
Low:	Little material loss of or modification to key elements / features / characteristics. i.e. modification or change is not uncharacteristic or prominent in views and absorbed within the receiving landscape. *Concise Oxford English Dictionary Definition* *Low: adjective- **1.** Below average in amount, extent, or intensity.*
Very Low:	Negligible loss of or modification to key elements/ features/ characteristics of the baseline, i.e. approximating a 'no change' situation and a negligible change in views.

Table 3: Determining the overall level of landscape and visual effects

Determination of "minor"

Decision makers determining whether a resource consent application should be notified must also assess whether the effect on a person is less than minor[5] or an adverse effect on the environment is no more than minor[6]. Likewise, when assessing a non-complying activity, consent can only be granted if the s104D 'gateway test' is satisfied. This test requires the decision maker to be assured that the adverse effects of the activity on the environment will be 'minor' or not be contrary to the objectives and policies of the relevant planning documents.

These assessments will generally involve a broader consideration of the effects of the activity, beyond the landscape and visual effects. Through this broader consideration, guidance may be sought on whether the likely effects on the landscape or effects on a person are considered in relation to 'minor'. It must also be stressed that more than minor effects on individual elements or viewpoints does not necessarily equate to more than minor landscape effects. In relation to this assessment, moderate-low level effects would generally equate to 'minor' (see **Table 4**).

The third row highlights the word 'significant' which has particular reference to the NZCPS and Policy 13 and Policy 15 and where on the effects-spectrum 'a significant' effect would be placed.

Less than Minor		**Minor**	**More than Minor**			
Very Low	**Low**	**Moderate – Low**	**Moderate**	**Moderate-High**	**High**	**Very High**
					Significant[7]	

Table 4: Determining adverse effects for notification determination, non-complying activities and significance

[5] RMA, Section 95E

[6] RMA Section 95D

[7] To be used only about Policy 13(1)(b) and Policy 15(b) of the New Zealand Coastal Policy Statement (NZCPS), where the test is 'to avoid significant adverse effects'.

Moutukawa HEPS Reconsenting

Figures to Accompany Assessment Report
Appendix 2

November 2021

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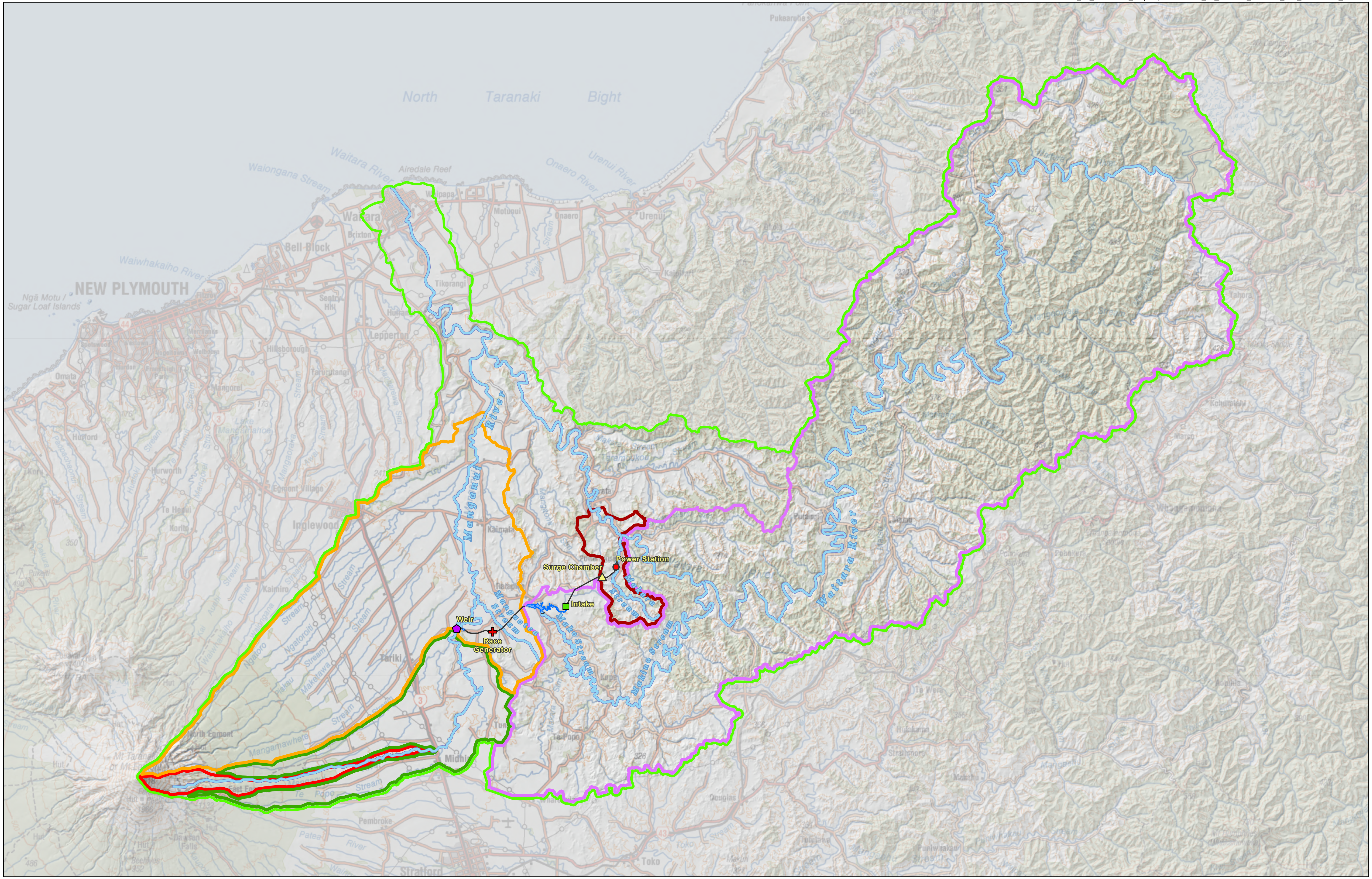
Appendix 2: Figures to Accompany Assessment

File Ref: A18287_26_Motukawa_Maps.aprx / A18287_26_Scheme_Location_and_Catchment_Extents



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0 4 8 km

1:200,000 @ A3

Data Sources: LINZ (Aerials, Cadastre), Tonkin + Taylor

Projection: NZGD 2000 New Zealand Transverse Mercator

LEGEND

Sub-Catchments
- Manganui at SH3
- Manganui at Tariki Weir
- Manganui at Everett Park
- Waitara above Makara Stream
- Waitara at Tarata

Manganui and Waitara Catchment

MOTUKAWA HEPS RECONSENTING

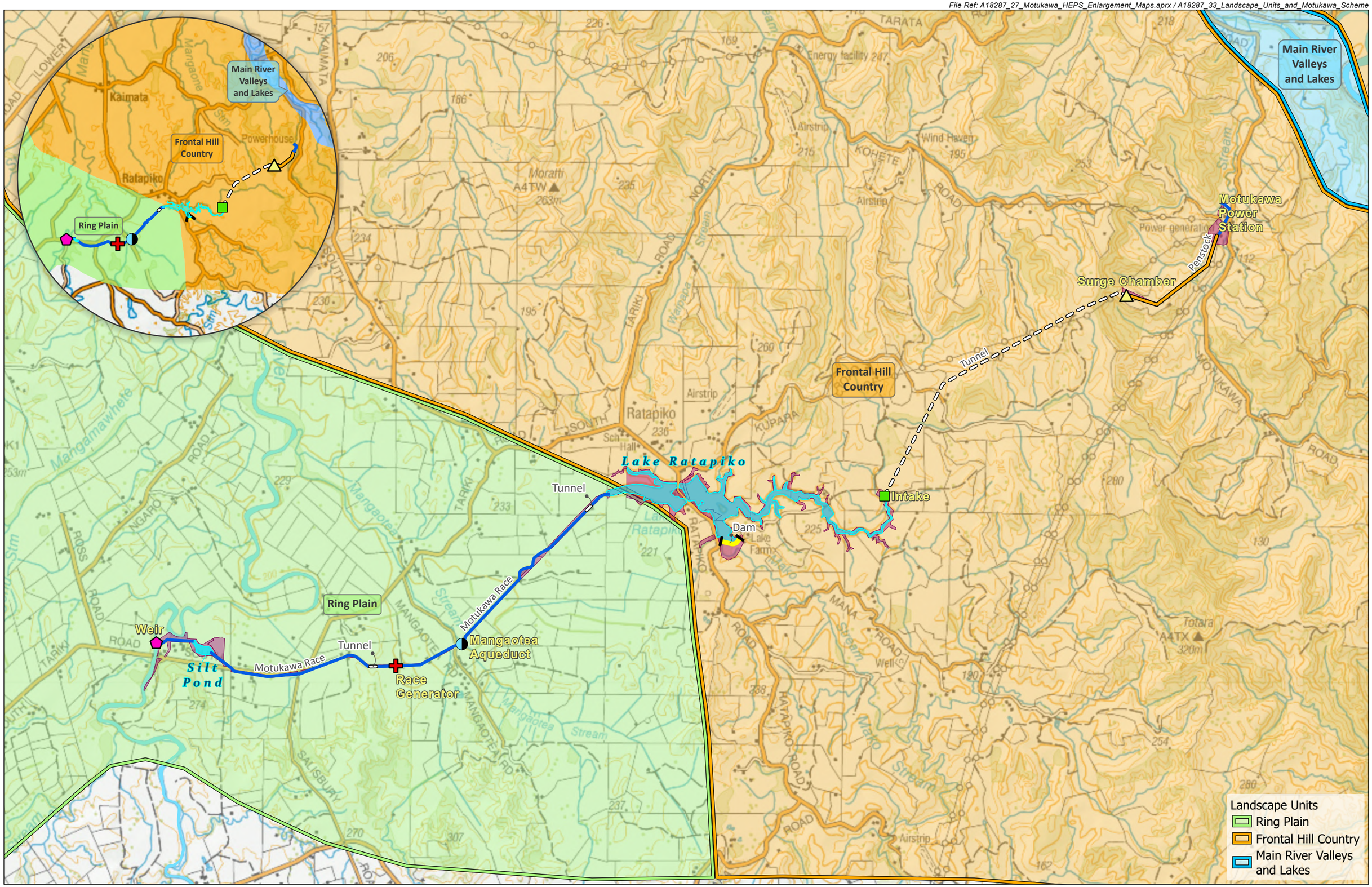
Scheme Location and Catchment Extents

Date: 16 November 2021 | Revision: 0

Plan prepared by Boffa Miskell Limited

Project Manager: John.Goodwin@boffamiskell.co.nz | Drawn: SGa | Checked: JGo

Figure 1



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0 0.5 1 km

1:30,000 @ A3

Data Sources: LINZ (Topo Maps), Tonkin + Taylor, New Plymouth District Landscape Assessment, BML

Projection: NZGD 2000 New Zealand Transverse Mercator

LEGEND

- Weir
- Intake
- Race Generator
- Surge Chamber
- Mangaotea Aqueduct
- Dam
- Canal
- Penstock
- Tunnel
- Lake
- Trustpower Owned Parcels

MOTUKAWA HEPS RECONSENTING

Landscape Units and Scheme Features

Date: 16 November 2021 | Revision: 0

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Figure 2

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0 0.5 1 km

1:30,000 @ A3

Data Sources: LINZ (Aerials, Cadastre), Tonkin + Taylor

Projection: NZGD 2000 New Zealand Transverse Mercator

LEGEND

- Motukawa Power Station
- Weir
- Intake
- Race Generator
- Surge Chamber
- Mangaotea Aqueduct
- Dam
- Canal
- Penstock
- Tunnel
- Lake
- Trustpower Owned Parcels
- Streams and Rivers

MOTUKAWA HEPS RECONSENTING

Scheme Overview

Date: 16 November 2021 | Revision: 0

Plan prepared by Boffa Miskell Limited

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Figure 3

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0 0.5 1 km

1:30,000 @ A3

Data Sources: LINZ (Aerials, Cadastre), Tonkin + Taylor

Projection: NZGD 2000 New Zealand Transverse Mercator

LEGEND

- Weir
- Intake
- Race Generator
- Surge Chamber
- Mangaotea Aqueduct
- Dam
- Canal
- Penstock
- Tunnel
- Lake
- Streams
- River Polygons

District Plan (Operative)

- Heritage Points
- Significant Natural Area

Proposed District Plan

- Significant Natural Areas
- QE2 Covenants

MOTUKAWA HEPS RECONSENTING

District Plan Overlays

Date: 16 November 2021 | Revision: 0

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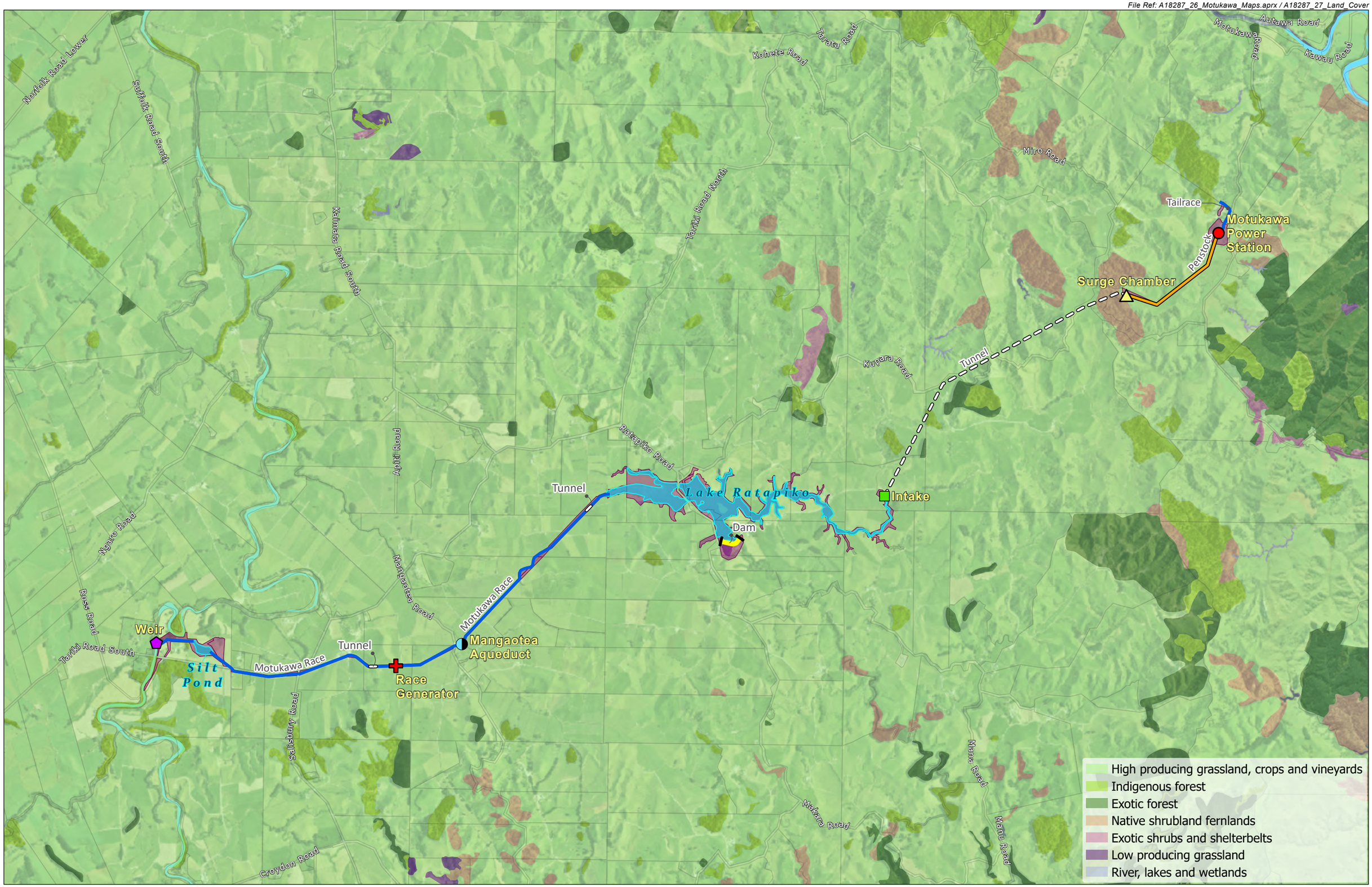
Figure 4



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0 0.5 1 km

1:30,000 @ A3

Data Sources: LINZ (Aerials, Cadastre), Tonkin + Taylor

Projection: NZGD 2000 New Zealand Transverse Mercator

LEGEND

- Motukawa Power Station
- Weir
- Intake
- Race Generator
- Surge Chamber
- Mangaotea Aqueduct
- Dam
- Canal
- Penstock
- Tunnel
- Lake
- Trustpower Owned Parcels

MOTUKAWA HEPS RECONSENTING

Land Cover

Date: 16 November 2021 | Revision: 0

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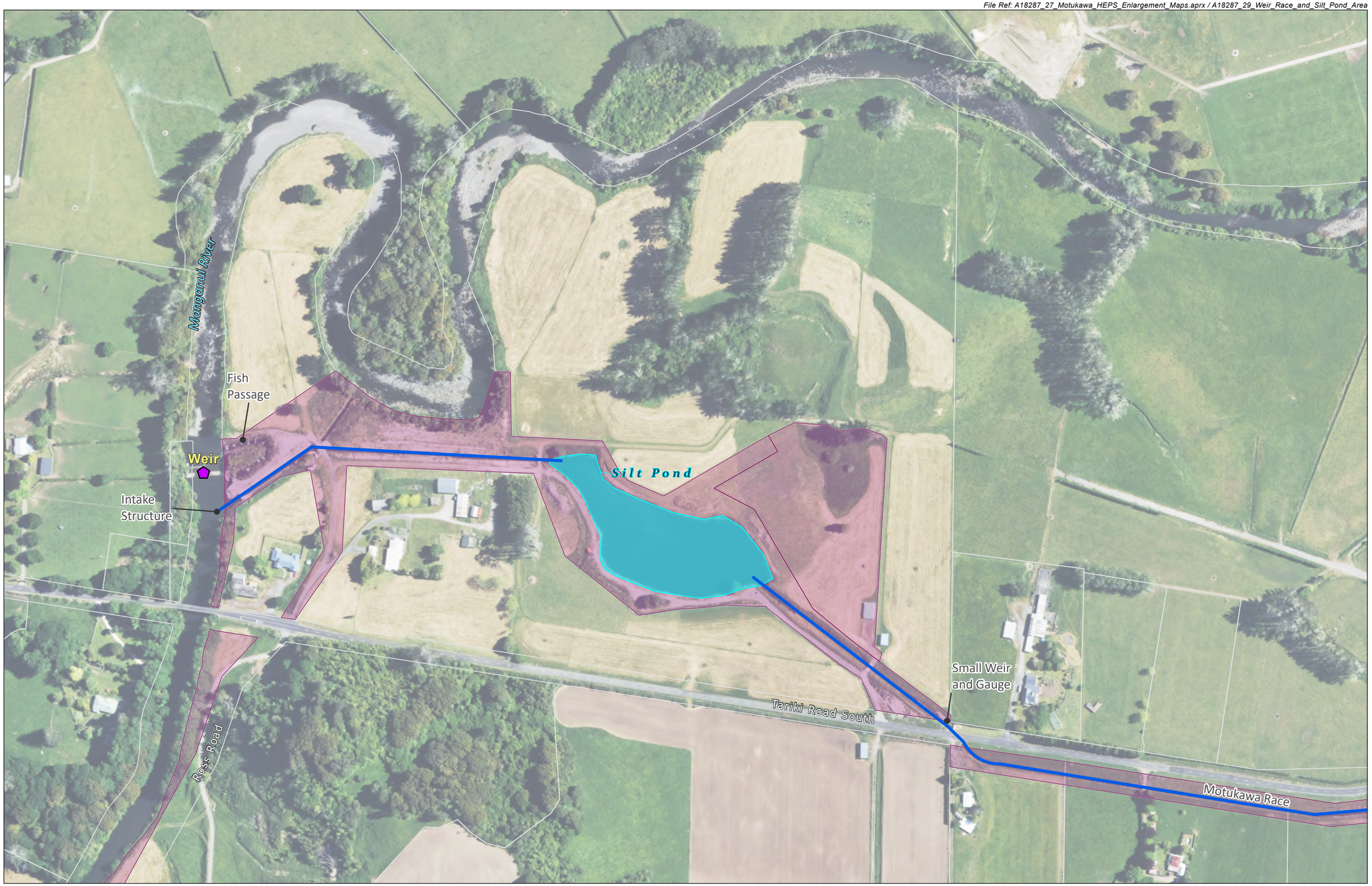
Figure 5



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0 50 100 m

1:3,000 @ A3

Data Sources: LINZ (Aerials, Cadastre), Tonkin + Taylor

Projection: NZGD 2000 New Zealand Transverse Mercator

LEGEND

- Weir
- Canal
- Pond
- Trustpower Owned Parcels
- Land Parcels

MOTUKAWA HEPS RECONSENTING

Weir, Race and Silt Pond Area

Date: 16 November 2021 | Revision: 0

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Figure 6

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0 50 100 m

1:3,000 @ A3

Data Sources: LINZ (Aerials, Cadastre), Tonkin + Taylor

Projection: NZGD 2000 New Zealand Transverse Mercator

LEGEND

- Race Generator
- Mangaotea Aqueduct
- Canal
- Tunnel
- Streams
- Trustpower Owned Parcels
- Land Parcels

MOTUKAWA HEPS RECONSENTING

Motukawa Race Area

Date: 16 November 2021 | Revision: 0

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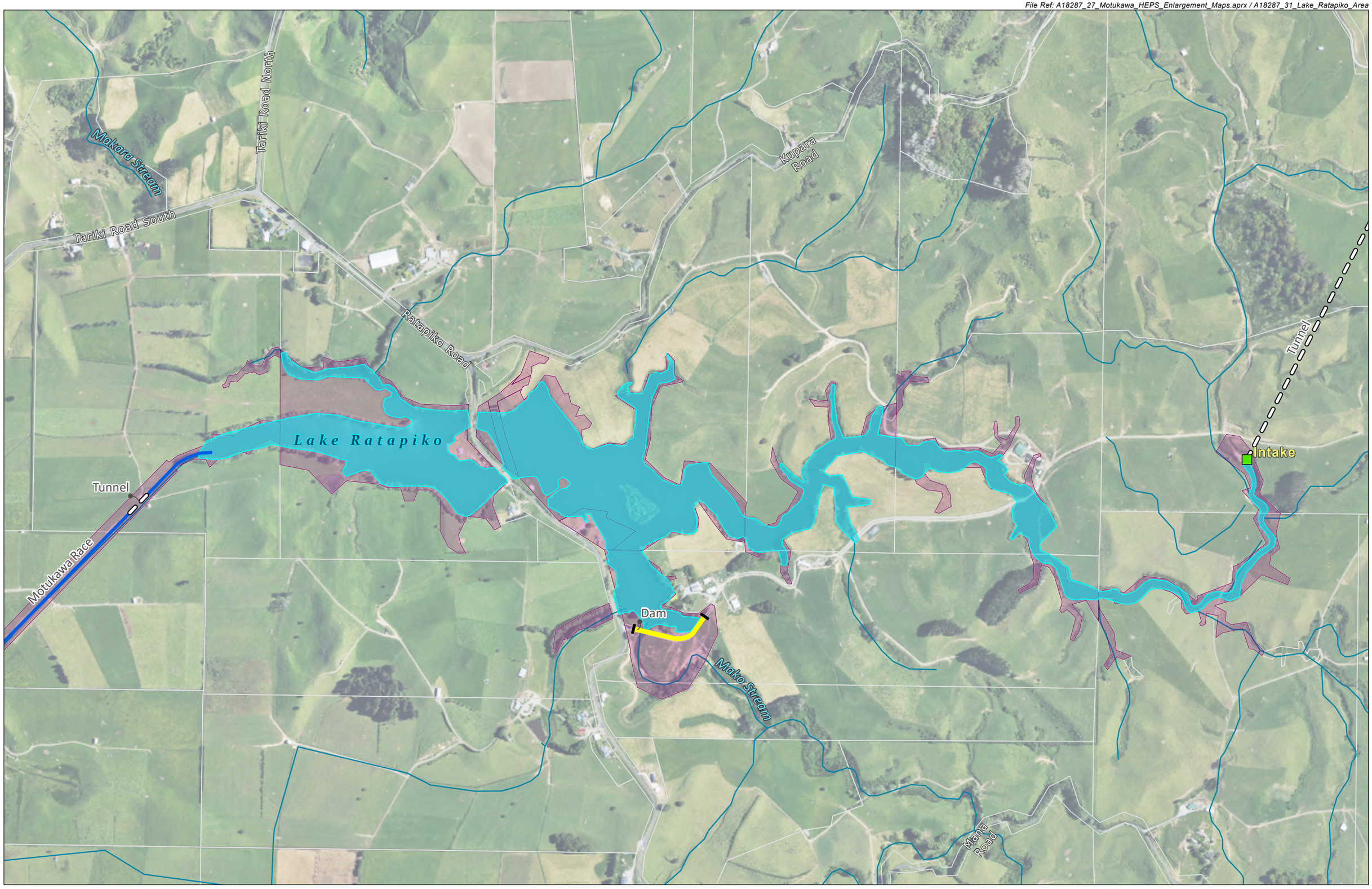
Figure 7



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0 100 200 m

1:8,000 @ A3

Data Sources: LINZ (Aerials, Cadastre), Tonkin + Taylor

Projection: NZGD 2000 New Zealand Transverse Mercator

LEGEND

- Intake
- Dam
- Canal
- Tunnel
- Lake Ratapiko
- Trustpower Owned Parcels
- Streams and Rivers
- Land Parcels

MOTUKAWA HEPS RECONSENTING

Lake Ratapiko Area

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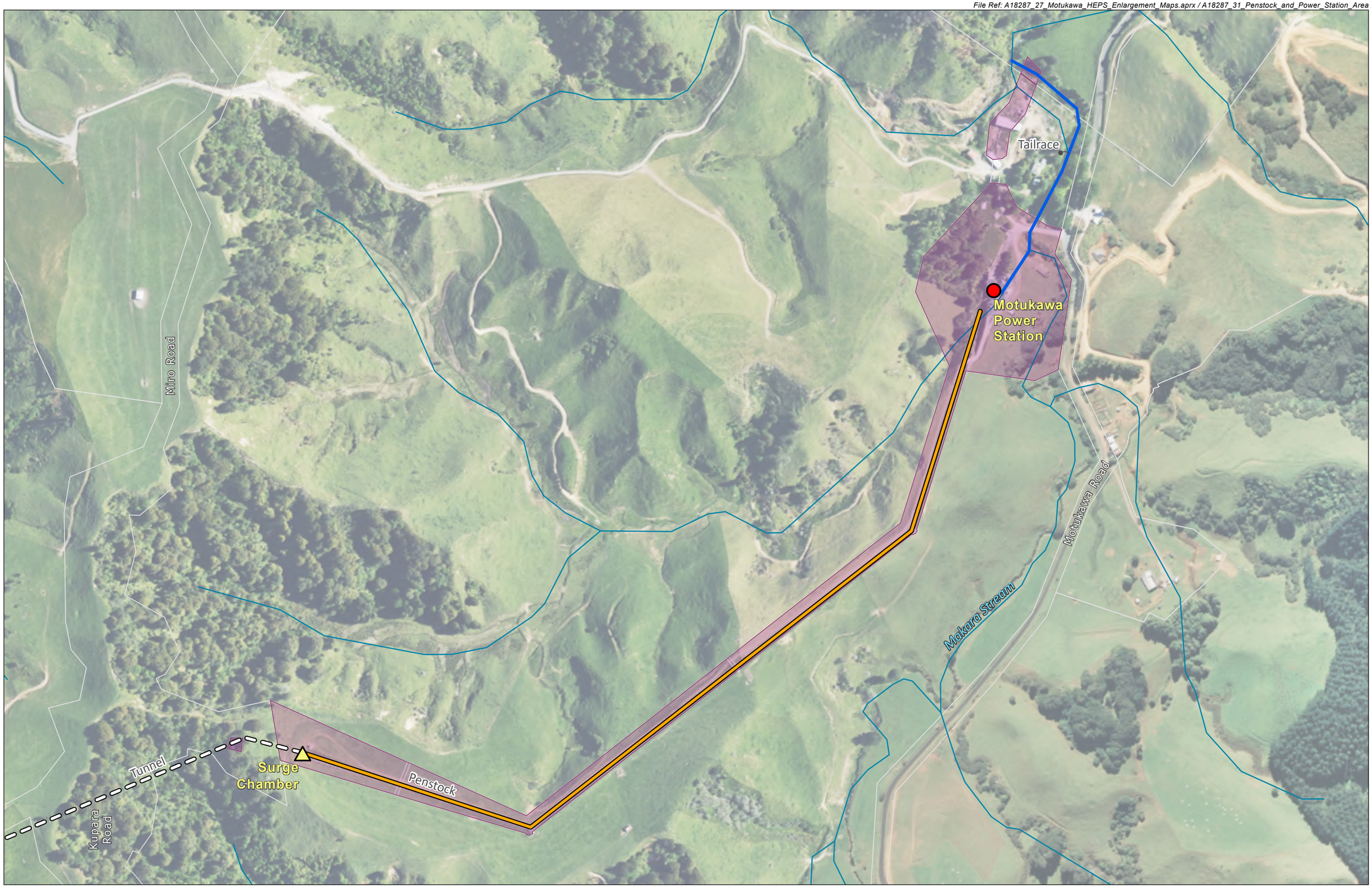
Figure 8



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0 50 100 m

1:4,000 @ A3

Data Sources: LINZ (Aerials, Cadastre), Tonkin + Taylor

Projection: NZGD 2000 New Zealand Transverse Mercator

LEGEND

- Motukawa Power Station
- Surge Chamber
- Canal
- Penstock
- Tunnel
- Trustpower Owned Parcels
- Streams and Rivers
- Land Parcels

MOTUKAWA HEPS RECONSENTING

Penstock and Power Station Area

Date: 16 November 2021 | Revision: 0

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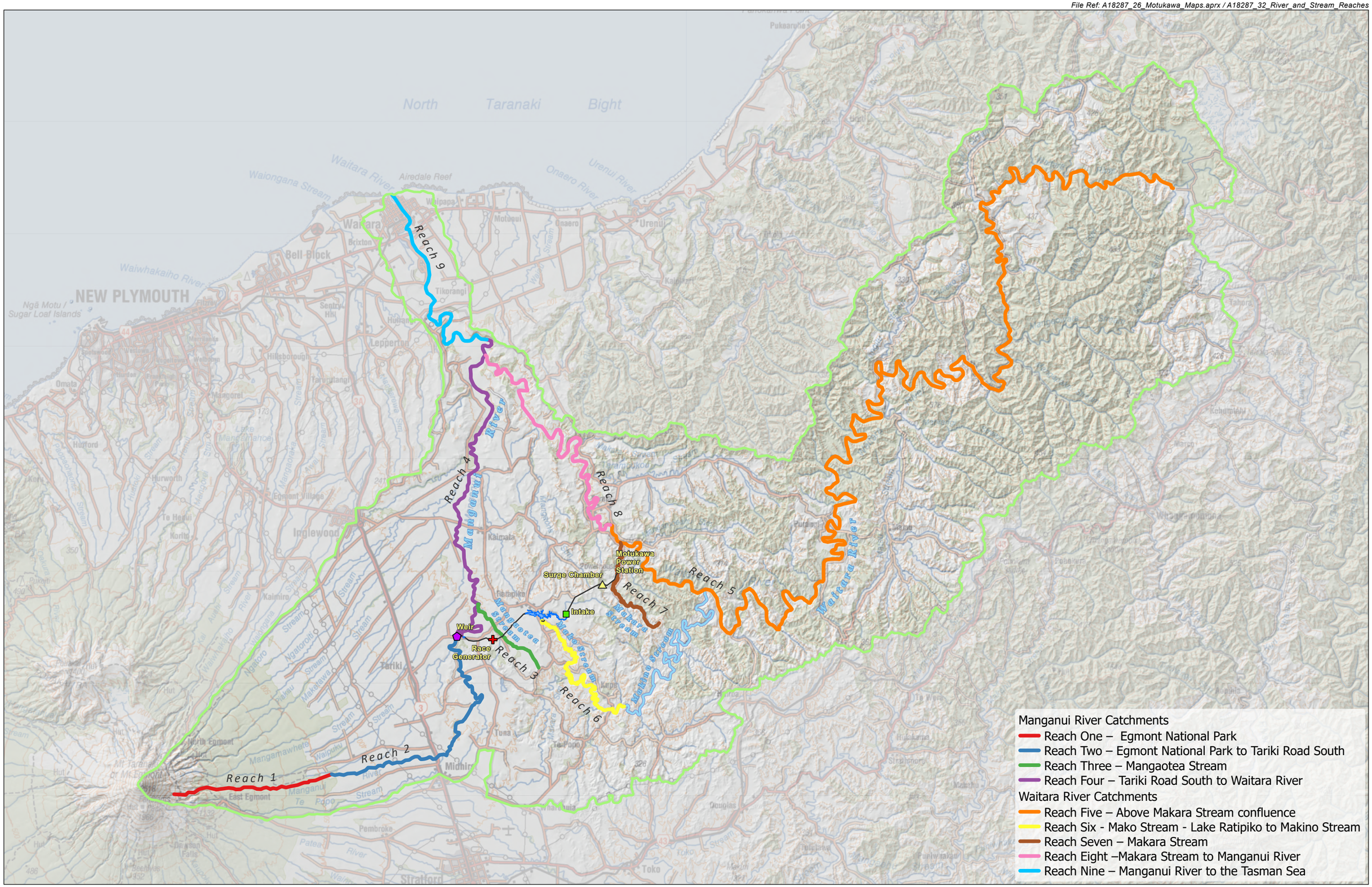
Figure 9



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0 4 8 km

1:200,000 @ A3

Data Sources: LINZ (Topo Maps), Tonkin + Taylor, BML

Projection: NZGD 2000 New Zealand Transverse Mercator

LEGEND

- Weir
- Intake
- Race Generator
- Surge Chamber
- Manganui and Waitara Catchment

MOTUKAWA HEPS RECONSENTING

River and Stream Reaches

Date: 16 November 2021 | Revision: 0

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Figure 10

Moutukawa HEPS Reconsenting

Photographs of Rivers, Streams and Scheme Elements
Appendix 3

November 2021

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Appendix 3: Photographs to Accompany Assessment

1. **Manganui River**
    - Weir at SH3 / Rail crossing
    - Upstream of Tariki Road South bridge
    - Downstream of Tariki Road South bridge to Weir
    - Weir and Intake Structure
    - Fish Passage
    - Weir and river below
    - Weir and take area context
    - Everett Park (upstream)
    - Everett Park (downstream)
2. **Waitara River**
    - Makara Stream confluence
    - Tarata Road Bridge (upstream)
    - Tarata Road Bridge (downstream)
    - Bertrand Road Bridge (upstream)
    - Bertrand Road Bridge (downstream)
3. **Motukawa Race and Mangaotea Stream**
    - Race upstream of Silt Pond
    - Silt Pond
    - Race below Silt Pond
    - Tariki Road Weir
    - In-race Generator
    - Race upstream of Mangaotea Stream
    - Mangaotea Stream Aqueduct
    - Mangaotea Stream landscape context
4. **Lake Ratapiko and Mana Stream**
    - Western Arm - New Plymouth Water Ski club (Boat Ramp)

- Eastern Arm – Jet Boating NZ area
- Mako Stream Dam
- Mako Stream Service Spillway
- Mako Stream Emergency Spillway
- Tunnel Intake
- Mako Stream upstream of Mana Road Bridge
- Mako Stream downstream of Mana Road bridge

5. Power Station Area and Makara Stream

- Penstock below Surge Chamber
- Penstock above Power Station
- Power station and Surrounds
- Tailrace Structure
- Makara Stream and environs below tailrace

1.0 Manganui River

Weir at SH3 / Rail Crossing

Upstream of Tariki Road South Bridge

Weir and Intake Structure

Fish Passage

Weir and River Below

Weir and Take Area Context

Everett Park (Upstream)

Everett Park (Downstream)

2.0 Waitara River

Makara Stream Confluence

Tarata Road Bridge (Upstream)

Tarata Road Bridge (Downstream)

Bertrand Road Bridge (Upstream)

Bertrand Road Bridge (Downstream)

3.0 Motukawa Race and Mangaotea Stream

Race Upstream of Silt Pond

Silt Pond

Silt Pond

Race Below Silt Pond

Tariki Road Weir

In-Race Generator

Race Upstream of Mangaotea Stream

Mangaotea Stream Aqueduct

Mangaotea Stream Aqueduct

Mangaotea Stream Landscape Context

4.0 Lake Ratapiko and Mana Stream

Western Arm – New Plymouth Water Ski Club Area

Western Arm – New Plymouth Water Ski Club Area

Western Arm – New Plymouth Water Ski Club Boat Ramp

Eastern Arm – Jet Boating NZ Area

Eastern Arm – Jet Boating NZ Area

Mako Stream Dam

Mako Stream Service Spillway

Mako Stream Emergency Spillway

Tunnel Intake

Mako Stream Upstream of Mana Road Bridge

Mako Stream Downstream of Mana Road Bridge

5.0 Power Station area and Makara Stream

Penstock Below Surge Chamber

Penstock Above Power Station

Power Station and Surrounds

Power Station and Surrounds

Tailrace Structure

Makara Stream and Environs Below Tailrace

Makara Stream and Environs Below Tailrace