

BOARD OF INQUIRY

**Tukituki Catchment
Proposal**

Draft Report and Decision

of the Board of Inquiry into the

Tukituki Catchment Proposal

Volume 1 of 3: Report and Decisions

Produced under Section 149Q of the Resource Management Act 1991

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Dated: April 2014

**BEFORE THE BOARD OF INQUIRY CONCERNING A PROPOSED
PLAN CHANGE AND APPLICATIONS FOR A NOTICE OF
REQUIREMENT AND RESOURCE CONSENTS MADE BY HAWKE'S
BAY REGIONAL COUNCIL AND HAWKE'S BAY REGIONAL
INVESTMENT COMPANY LIMITED IN RELATION TO THE TUKITUKI
CATCHMENT PROPOSAL**

IN THE MATTER

of the Resource Management Act 1991
and the deliberations of a Board of
Inquiry appointed under Section 149J of
the Act to consider a request for a
proposed plan change and applications
for a notice of requirement and
applications for resource consents by
Hawke's Bay Regional Council and
Hawke's Bay Regional Investment
Company Limited for the Tukituki
Catchment Proposal.

DRAFT REPORT AND DECISIONS OF BOARD OF INQUIRY

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Environment Commissioner Russell Howie (deputy chairperson)

Matthew Lawson (Member)

Loretta Lovell (Member)

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L Muldowney for Bel Group Limited

A Green for Ruataniwha Water Users Group

M Casey QC for Central Hawke's Bay District Council and Hastings District Council (in relation to the Ruataniwha Water Storage Scheme only)

S Gepp for Royal Forest and Bird Protection Society of NZ Limited

H Atkins for Horticulture New Zealand and others and Hastings District Council (in relation to Plan Change 6 only)

R Enright and N de Wit for Environmental Defence Society Inc.

J Ferguson and K Allan for Ngāti Kahungunu Iwi Incorporated and the Heretaunga parties (also referred to as Ngāti Kahungunu Iwi Incorporated and others)

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Other appearances: See Appendix 1.

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Glossary of terms

Abbreviation	Meaning
AEE	Assessment of Environmental effects
AEP	Annual Exceedance Probability
ANZECC	Australian and New Zealand Environment and Conservation Council
ANZECC guidelines	Australian and New Zealand Guidelines for Fresh and Marine Water Quality guidelines 2000
BBOP	Business and Biodiversity Offset Programme
BOI	Board of Inquiry
CEMP	Construction Environmental Management Plan
CFRD	Concrete-Face Rockfill Dam
CHBDC	Central Hawke's Bay District Council
CMA	Coastal marine area
Community Irrigation Scheme	A water supply system that is capable of providing irrigation water to multiple production land properties and other ancillary uses'.
CSA's	Critical source areas
CTMP	Construction Traffic Management Plan
Dairy NZ	Dairy NZ Limited
Desorption	The process of desorbing
DIN	Dissolved Inorganic Nitrogen
DOC	Director General of Conservation
DRP	Dissolved Reactive Phosphorus
DWSNZ	Drinking Water Standards for New Zealand 2005 (revised 2008)
E. coli	Escherichia coli
EDS	Environmental Defence Society Inc.
Enzymatic	Relating to, or produced by an enzyme
EAP	Emergency Action Plan
EPA	Environmental Protection Authority
FANZ	Fertilizer Association of New Zealand

FAT	Freshwater Animal Thresholds Model
Federated Farmers	Federated Farmers of New Zealand
FEMP	Farm Environmental Management Plan
Fish and Game	Hawke's Bay and Eastern Fish and Game Councils
Forest and Bird	Royal Forest and Bird Protection Society of New Zealand
Fonterra	Fonterra Co-operative Group Limited
GAZ	Groundwater Allocation Zones
GDP	Gross Domestic Product
GMDP	Groundwater Mounding and Drainage Monitoring Plan
GMP	Groundwater Management Plan
HAIL	Hazard Activities and Industries List
Hapū	Sub Tribe
HBDFA	Hawke's Bay Branch of the New Zealand Deer Farmers Association
HBDHB	Hawke's Bay District Health Board
HBEWG	Hawke's Bay Environmental Water Group
HBFFA	Hawke's Bay Farm Forestry Association
HBRC	Hawke's Bay Regional Council
HBRIC	Hawke's Bay Regional Investment Company Limited
HBWGI	Hawke's Bay Winegrowers Association Incorporated
HDC	Hastings District Council
Heretaunga	Te Taiwhenua o Heretaunga
Heretaunga parties	Te Taiwhenua o Heretaunga, Ngāti Hawea ki Matahiwi Marae, Waimarama Marae, Operation Patiki (Kohupatiki marae), Waipatu Marae (Ngāti Hawea, Ngāti Hori), Ruahapia Marae, and Ngai Te Upokoiri ki Omahu Marae.
Horticulture NZ and others	Horticulture New Zealand, Pipfruit New Zealand, Hawke's Bay Fruit and Vegetable Growers Associations, NZ Winegrowers, Hakes Bay Wine Growers, Heinz Watties.
IEMP	Irrigation Environmental Management Plan
IMOA	Integrated Mitigation and Offsetting Approach
ICA	Irrigation command area

Irrigation NZ	Irrigation New Zealand Incorporated
ISMMP	Infrastructure Stormwater and Maintenance Management Plan
Iwi Authority	Means the authority which represents an iwi and which is recognised by that iwi as having authority to do so.
Kaitiakitanga	Means the exercise of guardianship by the tāngata whenua of an area in accordance with tikanga Māori in relation to natural and physical resources; and includes the ethic of stewardship.
KN	Kaitiaki Runanga
Kv	Kilovolt
l/s	Litres per second
Land and Water Symposium	Hawke's Bay Regional Water Symposium Event
LUC	Land use capability
MAC	Māori Advisory Committee
MACNL	Maximum allowable catchment load
Mahinga kai	Food source
MALF	Mean annual low flow
Mana whenua	Means customary authority exercised by an iwi or hapū in an identified area
masl	metres above sea level
Mauri	Life force
MCE	Maximum credible earthquake
MCI	Macroinvertebrate community index
Mr Apple	Mr Apple NZ Limited
Mw	Moment magnitude scale used to measure earthquakes
MW	Megawatt
MWWG	Mana Whenua Working Group
N	Nitrogen
N ₂	Nitrogen gas
NES	National Environmental Standard
NES DWS	Resource Management (National Environmental Standards for Sources of Human Drinking Water) Regulations 2007

NH ₄	Ammonia
nitrate-N	Nitrate-nitrogen
NIWA	National Institute of Water and Atmosphere
NKII	Ngāti Kahungunu Iwi Incorporated
NO ₃	Nitrate
NO ₄	Nitrite
NO ₃ -N	Nitrate-nitrogen
NOF	National Objectives Framework
NoR	Notice of Requirement
NPS	National Policy Statement
NPSFM	National Policy Statement for Freshwater Management 2011
NPS REG	National Policy Statement for Renewable Electricity Generation 2011
NZCPS	New Zealand Coastal Policy Statement 2010
NZWAC	New Zealand Walking Access Commission 2010
OBJ	Objective (specific to Plan Change 6 the Hawke's Bay Regional Plan)
OPUS	OPUS International Consultants Limited
OVERSEER	Tool for on-farm nutrient management
P	Phosphorus
PAR	Population at risk
Particulate P	Particulate phosphorus
PC4	Plan Change 4
PC5	Plan Change 5
PC6	Plan Change 6
PFR	Plant and Food Research
Physicochemical	Being physical and chemical
PMF	Probable Maximum Flood
PMP	Phosphorus Management Plan
pNPSIB	Proposed National Policy Statement on Indigenous Biodiversity

pNES EFWL	Proposed National Environmental Standards on Ecological Flows and Water Levels
PMF	Probable Maximum Flood
POL	Policy (specific to Plan Change 6 of the Hawke's Bay Regional Plan)
Redfield ratios	Relationship (in concentration terms) between phosphorus and nitrogen within plant or algae cells.
RFERP	Reservoir Filling and Edge Rehabilitation Plan
RLG	Ruataniwha Leadership Group
RMA	Resource Management Act 1991
RRMP	Hawke's Bay Regional Resource Management Plan
RPS	Regional Policy Statement
RSG	Ruataniwha Stakeholder Group
RWUG	Ruataniwha Water Users Group
RWSS	Ruataniwha Water Storage Scheme
s 32 Evaluation Report	Section 32 Evaluation Summary Report for proposed Plan Change 6 Tukituki River Catchment, adopted by council on 24 April 2013.
SCEMPS	Supplementary Construction Environmental Management Plan
SMP	Sediment Management Plan
SH	State Highway
SKM	Sinclair Knight Merz
Sorbed	To collect by sorption
SPASMO	Soil Plant Atmosphere System Model
SWAZ	Surface Water Allocation Zones
Tamatea	Te Taiwhenua o Tamatea
Tāngata whenua	In relation to a particular area, means the iwi, or hapū, that holds mana whenua over that area.
Taonga	Treasures
The One Plan	Horizons One Plan
The water take regulations	Resource Management (Measuring and Reporting of Water Takes) Regulations 2010

Tikanga	Customary right, rule, plan, method
TNH ₃ -N	Total ammoniacal nitrogen
Tranche	A specified portion of groundwater from te Ruataniwha Plains (as defined by the BOI in this decision)
TRIM	Tukituki River Model
Tukituki or TT	In reference to objective, policy and rule titles in Plan Change 6. TT means Tukituki
Tukituki Choices	Tukituki Choices — a discussion of choices and opportunity for land and water management.
Tūpuna	Ancestors
Wāhi tapu	Sacred place/site
WDN	Water distribution network
WLSP	Water Level Safety Plan
WUA	Weighted Usable Area
WHBCB	Wellington Hawke's Bay Conservation Board
WOW	Walking on Water

SUMMARY OF REPORT AND DECISIONS

[1] The Tukituki Catchment Proposal was referred to the Board of Inquiry by the Minister for the Environment and the Minister of Conservation on 5 June 2013. This proposal involves a proposed Plan Change (PC6), 17 resource consent applications relating to the Ruataniwha Water Storage Scheme (RWSS), and a notice of requirement relating to the same scheme.

[2] A total of 384 submissions (plus 22 further submissions) were received. The Board conducted a hearing between 18 November 2013 and 21 January 2014, during which it heard evidence from 131 witnesses and representations by a further 74 submitters. By the time the hearing concluded the Board had before it more than 28,000 pages of material.

[3] Currently the waters of the middle and lower Tukituki catchment are in a degraded condition, particularly as a result of nuisance periphyton (an algae).

[4] PC6 is the first of a series of catchment specific plan changes that the Hawke's Bay Regional Council seeks to implement for the Hawke's Bay Region. Through this plan change (and future plan changes for other catchments) the Regional Council seeks to give effect to the National Policy Statement for Fresh Water Management 2011 by focussing on water quality and quantity issues in Hawke's Bay.

[5] The RWSS involves the proposed construction and operation of a dam and a 90 million m³ reservoir on the Makaroro River for irrigation purposes (with a small hydro-electric power station). If built the dam would be the largest irrigation dam in New Zealand and the largest dam to be built during the last 20 years. The irrigation distribution network would enable around 25,000ha of land to be irrigated.

[6] Both PC6 and the RWSS gave rise to a range of competing interests. A major issue concerned the balancing of intensification of land use with the protection of the environment, in particular the river system within the Tukituki catchment. Cultural issues, especially the relationship between Māori and the waters in the catchment, were also prominent.

[7] One of the most contentious features of PC6 as notified was its approach to managing phosphorus and nitrogen. The proposed plan adopted what was described as a 'single nutrient' approach focussing on the management of phosphorus. Nitrate-nitrogen controls were only intended to avoid toxicity effects on aquatic ecology.

[8] Having considered all the information before it, the Board rejected this approach in favour of a 'dual nutrient' control which manages both phosphorus and nitrogen. Rather than basing nitrogen limits on toxicity, the Board has taken instream ecological health as the basis of the levels it has set. With the exception of one zone, dissolved inorganic nitrogen levels have been set at 0.8mg/l. The exception is the zone in the headwaters of the catchment where the limit has been set at 0.15mg/l.

[9] Leaching rates for nitrogen based on the land use capability classification system have also been adopted and incorporated into PC6. In addition the Board has included a requirement for all farms within the Tukituki catchment that exceed 4ha (or 10ha where the land use is non-intensive) to prepare a Farm Environmental Management Plan. There are also stock management requirements in respect of waterways.

[10] In broad terms the proposed policies for the management of phosphorus in PC6 have been retained.

[11] Proposed minimum flows for the rivers in the catchment have been endorsed by the Board. However, the Board has increased the volume of water from the Ruataniwha aquifer that may be consented for irrigation purposes from a proposed 28.5 million m³/year (which represents the current extraction pursuant to consents) to 43.5 million m³/year provided that any reduction in surface water flows is compensated from deep groundwater.

[12] The resource consents sought for the RWSS have been granted, subject to conditions, and the notice of requirement has been confirmed, again subject to conditions.

PART 1

BACKGROUND

Introduction

[1] On 5 June 2013 the Minister for the Environment and the Minister of Conservation jointly referred the following matters to this Board pursuant to ss 142 and 147 of the Resource Management Act 1991 (RMA):

- Hawke's Bay Regional Council (HBRC) proposed Plan Change 6 (PC6) to the Hawke's Bay Regional Resource Management Plan (RRMP);
- applications by Hawke's Bay Regional Investment Company Limited (HBRIC) for 17 resource consents relating to the Ruataniwha Water Storage Scheme (RWSS);
- a notice of requirement (NoR) for a designation by the same company which also relates to the RWSS.

These matters, which are collectively referred to as 'the Tukituki Catchment Proposal', concern water and land resources within the Tukituki catchment of the Hawke's Bay region.

[2] Upon referral, the Board was required by the relevant provisions of the RMA to inquire into the Tukituki Catchment Proposal and upon completion of the inquiry, produce a draft report and decision for comment in accordance with s 149Q of the RMA. This is the draft report and decision.

[3] Notwithstanding that PC6 and the RWSS were referred to the Board at the same time and were of necessity heard together, the Board decided that each matter needed to be assessed and determined separately and consecutively, with PC6 being assessed and determined first. For that reason the Board has devoted separate parts of this report to each of those matters. Part 1 provides a background, Part 2 relates to PC6 and Part 3 to the RWSS.

[4] This part (Part 1) outlines various background matters that will provide a context for Part 2 and Part 3. It commences with an overview of the Tukituki catchment, PC6 and the RWSS. Then we outline the process by which the proposed plan change and storage scheme reached the Board and the manner in which we have conducted this inquiry. The approach that the Board has taken to a number of matters that involve both PC6 and the RWSS is then explained. Part 1 concludes by discussing the consistent theme that there is a need for a change in approach to the management of land and water resources.

The Tukituki Catchment

Overview

[5] The Tukituki catchment, which covers approximately 2,500km², is the third largest catchment in the Hawke's Bay region. The headwaters of the Tukituki River and its largest tributary the Waipawa River are located high in the Ruahine Ranges, with other tributaries having their headwaters in the foothills. These rivers and streams cross the Ruataniwha Plains and merge into the Tukituki River east of Waipukurau (Figure 1). Ultimately the Tukituki River flows into Hawke Bay about 105km from its source.

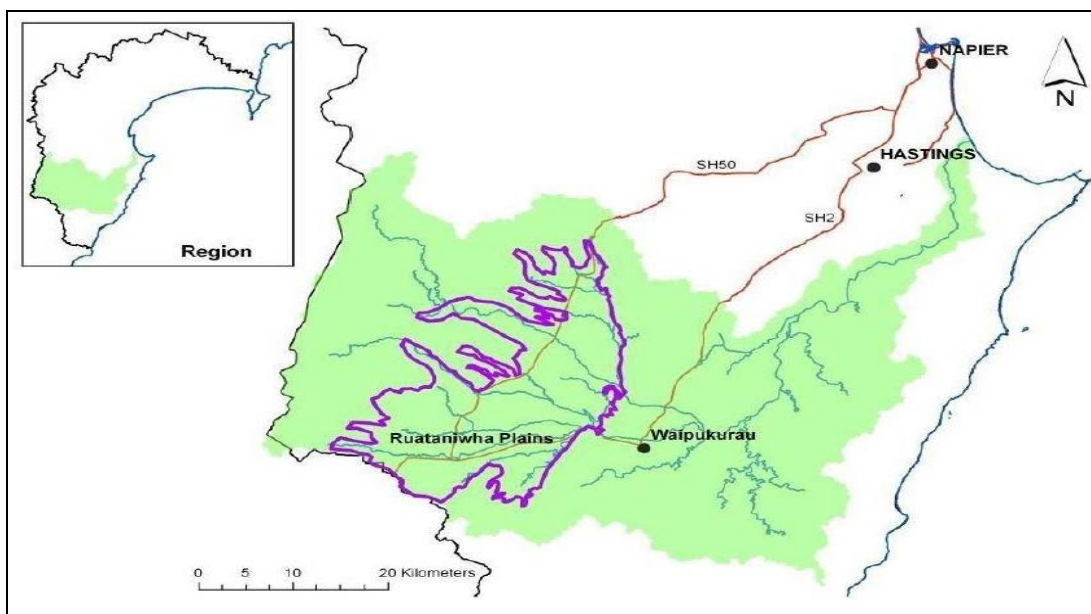


Figure 1: Tukituki Catchment and Ruataniwha Plains

[6] Over time a large part of the catchment has been modified by the clearance of vegetation, land drainage, and land development. However, the upper reaches of the

catchment within the Ruahine Forest Park have largely escaped human influence and are dominated by native vegetation.

[7] Below the ranges the foothills are predominantly used for pastoral farming, especially sheep and beef, and for forestry. On the Ruataniwha Plains and further down the catchment more intensive farming occurs, including some dairying, orcharding and other horticulture. At the bottom of the catchment viticulture and horticulture predominates. Currently it is estimated that of the catchment used for farming and forestry purposes, 70% is devoted to some form of sheep and beef enterprise, 18% to forestry, 4% to dairying, 5% to arable farming, and less than 1% for orcharding and viticulture.¹

[8] Lying as it does in the rain shadow of the Ruahine Ranges, the Hawke's Bay region is drier than most other regions in New Zealand.² Droughts are common and can be prolonged over summer months. Severe droughts were experienced between 2006 and 2009 and again in 2012/13. During these times low flows in the rivers within the catchment are common and there are indications that climate change will result in droughts becoming more prevalent and severe.³

[9] There is widespread concern about the quality of the water in the middle and lower reaches of the catchment. Prolonged low flows in summer months, high temperatures, and high in-stream nutrient concentrations, have led to excessive growth of periphyton which has adversely affected water quality (algae and slime).⁴ Restoration and protection of the health and wellbeing of the river for future generations is seen by many as a critical issue. Apart from their very significant cultural and spiritual values, the rivers and streams in the Tukituki catchment provide a popular resource for swimming, angling, food gathering and other recreational activities.

¹ Harris Consulting Ltd, Economic Impact of future nutrient reduction scenarios for the Tukituki River, 26 February 2013, Folder 5 of Plan Change application documents, Tab 12, page 4, paragraph 2.2. A figure showing the distribution of land use throughout the catchment can be found in A Uytendaal and O Ausseil, Tukituki Catchment recommended water quality limits and targets for the Tukituki Plan Change 6, February 2013, Folder 4 of Plan Change application documents, Tab 1, Figure 5.

² I Maxwell, Evidence in Chief, paragraph 3.6.

³ J Renwick, Climate Change and its implications for Ruataniwha Water Storage Scheme, May 2013, Ruataniwha Water Storage Scheme application documents, Key Reference Report, Folder 3, Tab 3.

⁴ I Maxwell, Evidence in Chief, paragraph 3.17.

Aquifers

[10] Beneath the Ruataniwha Plains is a multi-layered and interconnected aquifer system covering 800km². At any one time this system contains about 8 billion m³ of water.⁵ Beneath the aquifer system is a relatively impermeable mudstone/siltstone basement and at some locations the aquifer system extends to a depth of 200m.⁶ Twelve rivers and streams flow across this basin.

[11] The aquifer is directly recharged largely by rainfall with a smaller contribution indirectly from river seepage. Apart from groundwater that is extracted for irrigation and other purposes, evapotranspiration and spring discharge, the overwhelming bulk of the groundwater leaves the Ruataniwha basin along its eastern boundary through rivers and streams. Travel time of water through the aquifer varies and in some parts it can take 10 years, whereas in others it can take more than 100 years.⁷

[12] Another relatively small groundwater resource exists beneath the Papanui basin which is located north-east of Waipukurau. However, information about this resource is limited⁸ and further investigation of the basin is taking place.

[13] At the lower end of the catchment the Tukituki River meets the Heretaunga Plains. Gravels from the river have been deposited onto the south eastern part of the Heretaunga Plains forming a shallow (0–50m in depth) semi-confined aquifer known as the Tukituki aquifer system. It is likely that this aquifer is at least partially connected to the Heretaunga Plains aquifer system. Pressure differences mean that there will be a tendency for groundwater to move from the Heretaunga aquifer into the Tukituki aquifer.⁹

⁵ J Weir, Tukituki Catchment Proposal Hearing Transcript, page 1456 and I McIndoe, Concise Summary Ruataniwha Water Users Group, Page 1, paragraph 4.

⁶ H Baalousha, Evidence in Chief, paragraph 5.1.

⁷ H Baalousha, Tukituki Catchment Proposal Hearing Transcript, page 277.

⁸ H Baalousha, Evidence in Chief, Section 6.

⁹ H Baalousha, Evidence in Chief, Paragraph 24 and I Maxwell, Evidence in Chief, paragraph 3.15.

Irrigation

[14] Over recent times the total land area on the Ruataniwha Plains under irrigation has increased significantly. In 1995 about 2200ha was under irrigation and by 2009 that had increased to 6–7000ha. In 1990 around 3million m³ of water was extracted from the Ruataniwha aquifer pursuant to resource consents. Today the figure stands at approximately 25million m³ (plus around 1.5million m³ of water taken as permitted takes pursuant to s 14(3)(b) of the RMA or the rules of the Regional Resource Management Plan (RRMP¹⁰).

[15] Since about 2004 HBRC has proceeded on the basis that surface water resources on the Ruataniwha Plains have been fully allocated. As a result water users have looked to the groundwater resource as an alternative supply. Hence the very substantial increase in extraction from the aquifer. Dr Husam Baalousha, the Senior Hydrogeologist at HBRC, considers that this has caused a decrease in aquifer levels in parts of the basin.¹¹

[16] Across the entire catchment there are 174 groundwater take consents and 98 consents authorising extraction of surface water. Generally these consents do not specify a seasonal or annual volume, but the surface takes and some shallow groundwater takes are subject to minimum flow conditions.

Key issues for the catchment

[17] When Helen Codlin took up her position in 2008 as HBRC Group Manager Strategic Development she considered that the key planning issues for the Tukituki catchment were:¹²

- “1. New surface water allocation limits in the RRMP had put many parts of the Tukituki and Catchment in a state of over-allocation.
2. Revised minimum flow limits had been set under a negotiated [Environment Court] consent order in 2006 with a commitment to

¹⁰ H Baalousha, Evidence in Chief, paragraph 5.6 and P Barrett, Evidence in Chief, paragraph 5.15.

¹¹ H Baalousha, Evidence in Chief, paragraph 5.7.

¹² H Codlin, Evidence in Chief, paragraph 5.1.

undertake further investigations and review if necessary, but this was still a work in progress.

3. Lack of information about the ground water and surface water connections was hindering new irrigation activity.
4. Three consecutive summer droughts over 2006 – 2009 had caused impacts on the security of water supply for irrigators under their existing consent conditions.
5. Excessive growths of algae and slime in the Tukituki River, particularly in the lower Tukituki River during the drought periods were impacting on recreational and trout fishing values.”

Thereafter HBRC began working on a range of strategies and solutions which ultimately culminated in PC6 and the RWSS, to which we now turn.

Plan Change 6

[18] This proposed plan change is the first of a series of catchment specific plan changes that HBRC intends to implement for its region. PC6 inserts two new chapters (5.9 and 6.9) into the RRMP which became operative in 2006. It also makes a number of consequential amendments to other parts of the Regional Plan. These new chapters and consequential amendments apply to the whole of the Tukituki catchment from high in the Ruahine Ranges down to the landward boundary of the coastal marine area.

[19] Chapter 5.9 contains the objectives (5.9.1), water quality policies (5.9.2) and water quantity policies (5.9.3) that would apply to the Tukituki catchment. Chapter 6.9 contains the catchment rules relating to land use and water quality (6.9.1) and water takes (6.9.2). An extensive glossary of terms shall be added to the existing glossary of terms in the RRMP. There are also a series of schedules and maps.

[20] In broad terms PC6 as notified seeks to:

- implement and give effect to the National Policy Statement for Freshwater Management 2011 (NPSFM);
- address specific water allocation and water quality issues in the catchment through five objectives;

- set water quality limits and targets (through policies and rules) to achieve the objectives and implement a nutrient management framework;
- set new water allocation limits;
- increase current minimum flows;
- provide for the consideration of community irrigation schemes.

Supporting the plan change is a non-regulatory implementation plan which is designed to assist the transition of landholders to the policies and rules in the plan and promote effective on-farm management practices.

[21] A more comprehensive description of PC6 will be provided in Part 2.

[22] Following public notification by HBRC of the plan change on 4 May 2013, the council received 80 submissions. However rather than considering those submissions itself, HBRC resolved to seek ‘an integrated decision-making approach’ by asking for PC6 to be ‘called in’ by the Ministers and for both PC6 and the RWSS to be heard by a single board of inquiry.¹³

Ruataniwha Water Storage Scheme

[23] While HBRC was developing the strategies that culminated in PC6 it was also exploring the possibility of water storage in the Tukituki catchment. The Council contemplated that if storage was a viable alternative it might also offer opportunities for improving instream values for recreation, angling, and ecosystem health.¹⁴

[24] Having initially assessed 18 potential dam sites and the possible alternative of on-farm storage, HBRC decided to pursue a water storage scheme involving a dam on the Makaroro River. In broad terms the scheme involves the harvesting of water during winter or at other times of high flow and releasing flows back into the river to satisfy irrigation demand, an environmental river flow regime, and electric power generation.

¹³ H Codlin, Evidence in Chief, paragraph 9.5.

¹⁴ H Codlin, Evidence in Chief, paragraph 2.6.

[25] It was anticipated that the scheme would provide a reliable supply of irrigation water for approximately 25,000ha of land, primarily on the Ruataniwha Plains. In addition it would provide enhanced flows during summer months to help support river ecology as well as providing ‘flushing flows’ to assist with the management of nuisance periphyton.

The proposed scheme

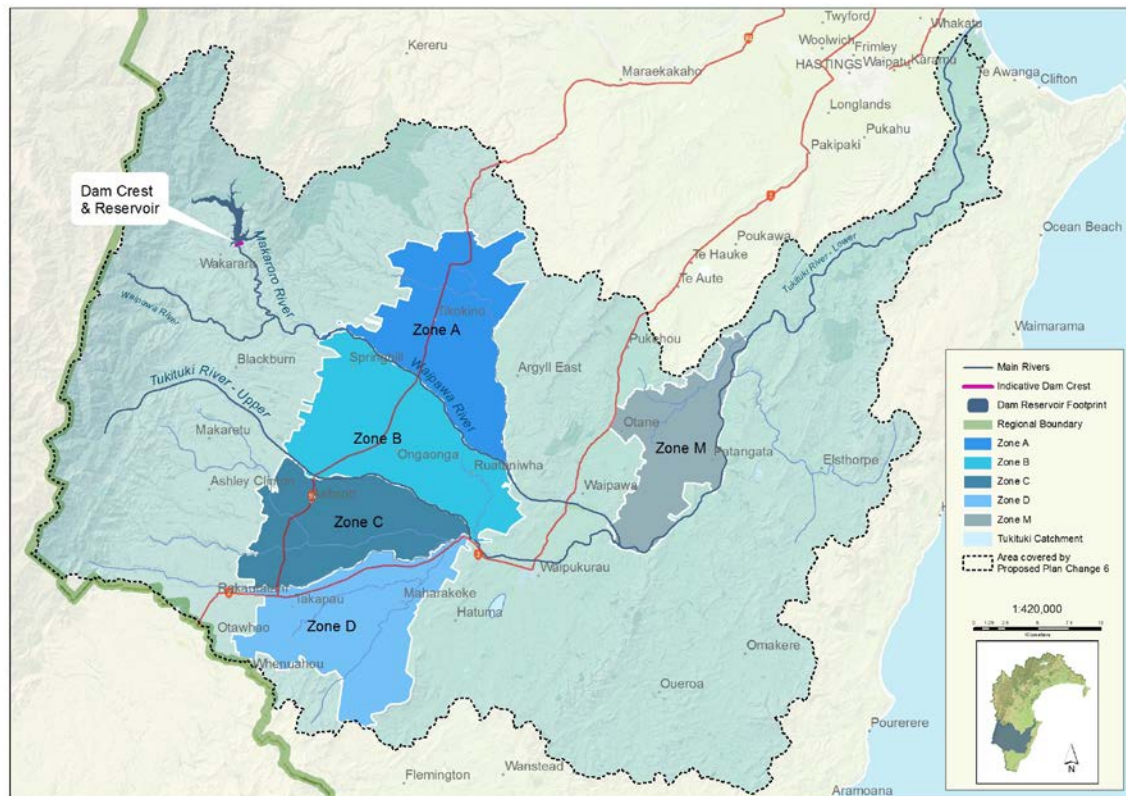


Figure 2: The dam, reservoir, and irrigation Zones A–D and M

[26] At its highest point the concrete-faced rockfill dam would be 83m high with a crest of 505m long and 8m wide. It would have the capacity to store 90million m³ of water with the lake behind the dam extending for almost 7km at full capacity. A small 6.5 megawatt hydro electric power station is proposed to be constructed at the toe of the dam. If constructed this dam will be the largest irrigation reservoir in New Zealand and the dam will be the largest to be constructed during the last 20 years.

[27] Flows released from the dam would supply water to five irrigation zones (A–D and M) (Figure 2).

[28] Several kilometres below the dam an intake structure on the Waipawa River will collect flows for distribution to Zones A–D via approximately 18km of open head races and pipelines extending over a further 18km. A secondary piped distribution network system of approximately 121km would bring water to farm gates within the four irrigation zones.

[29] Further downstream another water intake on the Waipawa River would provide irrigation water for Zone M. This water would flow along the old Waipawa riverbed into the Papanui Stream, which together would effectively provide the primary distribution network for Zone M. Individual farm intakes will be installed at various locations along the length of the old Waipawa riverbed/Papanui Stream.

[30] Irrigation Zones A–D and M cover around 25,000ha and it is anticipated that beyond that further farmland would be indirectly influenced. Thus a large area of land is likely to be affected if the RWSS proceeds.

[31] Depending on soil types it is anticipated that a high proportion of the irrigated land may be used for dairying and arable farming. According to an economic assessment¹⁵ 37% may be under dairying and 32% under mixed and intensive arable farming. The remaining 31% could consist of mixed finishing farms, dairy support, orchards and vineyards.

[32] It is estimated that the dam and distribution network would cost around \$265m. When on-farm costs are taken into account the total cost of the project would be likely to be in the region of \$650m.

[33] A more comprehensive description of the RWSS will be provided in Part 3.

Hawke's Bay Regional Investment Company Limited

[34] Having decided to pursue the water storage scheme, HBRC transferred responsibility for obtaining the necessary consents to HBRIC which is wholly owned by HBRC. HBRIC acquired Requiring Authority Status under s 167 of the RMA.

¹⁵ A Macfarlane, Evidence in Chief, paragraph 4.1.

[35] If the consents and NoR are granted, HBRIC would have responsibility for progressing the scheme up to the point when a final decision would be made to proceed with construction. Ultimately an investor consortium would have responsibility for owning and operating the RWSS.¹⁶

Application for resource consents and NoR

[36] On 6 May 2013 HBRIC lodged 17 applications for resource consents and a NoR with the Environmental Protection Authority (EPA) pursuant to s 145 of the RMA. The applications for resource consent concern the construction, operation, and maintenance of the dam and related structures; water intakes and diversions; outfall structures and discharges; and mitigation and offset work (including beach re-nourishment). The NoR concerns the construction, operation and maintenance of the primary distribution network.

[37] Fifteen of the resource consent applications come within the administrative jurisdiction of HBRC. Of the remaining applications, one comes within the jurisdiction of Central Hawke's Bay District Council (CHBDC) and one within the jurisdiction of Hastings District Council (HDC). The NoR comes within the jurisdiction of CHBDC.

Ministerial referral to this Board of Inquiry

[38] This section explains how the Tukituki Catchment Proposal came to be referred to the Board.

Statutory framework

[39] Part 6AA of the RMA confers on the Minister for the Environment (jointly with the Minister of Conservation where a coastal marine area is involved), power to set in motion procedures by which plan changes, resource consents and notices of requirement can be referred to a Board of Inquiry.

[40] In this case the Ministers were requested by HBRC to 'call in' PC6, and refer it to a Board of Inquiry pursuant to s 142 on the basis that it was part of a proposal of

¹⁶ G Hansen, Evidence in Chief, paragraph 2.8.

national significance. The other component of national significance was the RWSS in respect of which the 17 applications for resource consent and application for NoR were lodged with the EPA pursuant to s 145.

[41] When deciding whether to make a decision ‘calling in’ PC6 the Ministers were required by s 142(4) to have regard to the:

- views of the applicant and the local authorities involved;
- capacity of the local authorities to process the matter; and
- recommendation of the EPA.

[42] Under s 147(4) the Ministers were required to have regard to identical matters when considering whether the applications for resource consent/notice of requirement should be referred to a Board of Inquiry.

[43] Both HBRC in its capacity as proponent of PC6, and HBRIC as applicant for the resource consents/NoR, sought referral of PC6 and the RWSS to a single independent Board of Inquiry. They did so on the broad basis that both matters were linked and were matters of national significance that had aroused widespread public interest.

[44] Given its relationship to HBRIC, HBRC considered that it did not have ‘the capacity or the perceived level of independence’¹⁷ to process the RWSS applications/NoR. HBRC also believed that it was highly desirable for the storage scheme proposal to be heard in combination with PC6. For their part both HDC and CHBDC considered that they did not have the resources to process the RWSS applications. The EPA recommended that both matters be referred to a single Board of Inquiry.¹⁸

¹⁷ Environmental Protection Authority (EPA) Recommendation, 10 May 2013, paragraph 95.

¹⁸ EPA Recommendation, 10 May 2013, paragraph 98.

[45] On 5 June 2013 the Ministers directed that the Tukituki Catchment Proposal be referred to a Board of Inquiry. Given that the Board is required to have regard to the Ministers reasons¹⁹ it is appropriate that we reproduce those reasons:

National significance

The matters proposed by HBRC and HBRIC are part of a proposal of national significance having given regard to the following relevant factors in section 142(3) of the RMA:

- The Ruataniwha Water Storage Scheme would involve significant use of natural and physical resources (section 142(3)(a)(ii)). The Ruataniwha Water Storage Scheme would require construction of a dam that would be 83 metres high (at its deepest point), with a 505 metre wide crest behind which 90 million cubic metres of water would be stored. The proposed dam would use 37,500 cubic metres of concrete for the dam face and foundations and 2.5 million cubic metres of rock and alluvial material for construction. The irrigation network comprises 36 kilometres of headrace canal and primary pipeline and 121km of secondary distribution pipeline. Significant linear earthworks would be needed to construct the headrace canal and pipeline network. The matters applied for in the construction of the proposed dam and headrace canal distribution network include significant associated infrastructure, such as small quarries to supply raw material, a concrete batching plant, workshops, access roads and worker habitation. Construction is anticipated to take four and half years. In addition, Plan change 6 addresses significant use of natural and physical resources including by setting minimum flows and managing agricultural nutrient inputs to the catchment.
- The Ruataniwha Water Storage Scheme would result in significant change to the environment (section 142(3)(a)(v)). The proposed dam would be the largest dam to be constructed under the RMA, and the largest constructed in New Zealand for irrigation purposes. A reliable water supply for irrigation is proposed to allow for intensification of agriculture and horticulture, with flow on social, economic, cultural, recreational and environmental effects. Concurrently, Plan change 6 would set higher minimum flows and controls to limit nutrient runoff that are designed to reverse the ecological degradation that has occurred in the Tukituki River in recent decades. The proposed dam and reservoir would prevent migration of freshwater species resulting in a loss of river habitat for some species. They would change the sediment balance in the river by trapping larger sediment behind the dam. Six kilometres of braided river channel of the upper Makaroro River are proposed to be inundated by the reservoir resulting in a direct loss of river habitat.

¹⁹ s 149P(1)(a) of the Resource Management Act 1991.

- The Ruataniwha Water Storage Scheme affects more than one region or district as it is proposed to extend into Central Hawke's Bay and Hastings Districts, being within the boundary of Hawke's Bay Regional Council (section 142(3)(a)(ix)).
- The Tukituki Catchment Proposal, and its parts, is likely to be significant in terms of section 8 of the RMA (Treaty of Waitangi) (section 142(3)(a)(vii)). In reference to the principle of active protection the Ruataniwha Water Storage Scheme is expected to contribute to an improvement in habitat for taonga species including longfin eel, koaro and bluegill bully over the summer months due to environmental water releases, and the progressive return to natural flows in wetlands and waipuna. The components of the Ruataniwha Water Storage Scheme may impact on the mauri of the Tukituki Catchment, through damming the natural flow of the Makaroro River, abstracting large volumes for irrigation and diverting flows via the headrace canal and pipeline network into new river channels. The Ruataniwha Water Storage Scheme's suggested co-management structures could provide for a more consistent planning approach towards the development of outcomes, indicators and monitoring measures seeking to improve the Mauri of the Tukituki river catchment.
- The Tukituki Catchment Proposal and its parts has aroused widespread public interest regarding its actual or likely effects on the environment (section 142(3)(a)(i)). The combined proposal is intended to address many of the on-going issues with the river. There are competing views on what is the best outcome for the river. Local media has indicated that the proposed Ruataniwha Water Storage Scheme is polarising the Hawke's Bay community. It would involve a significant investment by Hawke's Bay Regional Council in irrigation infrastructure and some groups have expressed concern that ratepayers should be more involved in such decisions. Plan change 6 has also aroused widespread public interest as the Tukituki River experiences low flows in summer and a degraded water quality from nutrient enrichment. The Proposal is intended to address many of the on-going management issues with the river, such as minimum flows, riparian protection, and nutrient management.
- Plan change 6 involves methods for water and land management that are new to New Zealand and may affect its environment. Catchment-wide land use, river and groundwater modelling is a relatively novel process in New Zealand, which would provide for integrated management of the water resource in the catchment. Progress on catchment planning in Hawke's Bay is guiding water management planning in other areas of New Zealand. The process may to be used as a prototype for other areas looking to implement the Freshwater NPS and the recommendations of the Land and Water Forum.
- Both Hastings District Council and Central Hawke's Bay District Council are the territorial authorities with jurisdictions relevant to the Tukituki Catchment Proposal and its parts. The Councils consider that the Ruataniwha Water Storage Scheme meets some of the tests for national significance under section 142(3) of the RMA. In addition, the Councils note that application is without precedent in Hawke's Bay and demands a level of logistical support and integrated decision making that exceeds the existing capacity of both territorial authorities.

- Hawke's Bay Regional Council is the regional council with jurisdiction relevant to the Ruataniwha Water Storage Scheme and is the proponent of Plan change 6. Hawke's Bay Regional Council considers that Plan change 6 and the Ruataniwha Water Storage Scheme are linked and together make up the Tukituki Catchment Proposal. The Council's opinion is that the Tukituki Catchment Proposal is of national significance and it is highly desirable that the two components are considered and heard in combination. Hawke's Bay Regional Council is also of the opinion that it does not have the capacity or perceived level of independence to hear and decide the Tukituki Catchment Proposal.
- Hawke's Bay Regional Investment Company is the applicant for the Ruataniwha Water Storage Scheme. It considers that the Ruataniwha Water Storage Scheme is part of a nationally significant proposal, being the Tukituki Catchment Proposal. It notes that, given the close connection between the two parts of the Proposal it would be most efficient for them to be heard together. In addition, given the Hawke's Bay Regional Investment Company is a council controlled organisation, it considers that it would be inappropriate for Hawke's Bay Regional Council to have a decision making role.

Direction to a Board of Inquiry

We propose to refer the Ruataniwha Water Storage Scheme and Tukituki Plan change 6, together as parts of the Tukituki Catchment Proposal to a board of inquiry. Before reaching our decision to direct matters to be referred to a board of inquiry for decision we considered the following relevant factors:

- The Environmental Protection Authority recommendation that we refer the matter to a board of inquiry.
- The Ruataniwha Water Storage Scheme would be the largest irrigation project in New Zealand. It is our view that directing this proposal to a board of inquiry recognises the importance of this infrastructure to the Government.
- Plan change 6 represents one stage of the Hawke's Bay Regional Council's notified Progressive Implementation Plan to implement the National Policy Statement for Freshwater Management. Directing this part of the proposal to the same board of inquiry as the Ruataniwha Water Storage Scheme would ensure decision making for the Tukituki Catchment is managed holistically.
- The board of inquiry process is designed specifically to consider matters of national significance, to allow for timely, comprehensive, independent decision making within a streamlined process.
- Referring these matters to a board of inquiry provides for a decision within a nine month statutory timeframe. The Environment Court or the relevant local authorities are not subject to this timeframe. Central Hawke's Bay District Council has indicated a preference for the proposal being referred to a board of inquiry as the certainty of timeframe would assist with their district plan review.

- The views of the applicant and the relevant local authorities that would have processed and decided the matters if we had not directed the matters to be referred to a board of inquiry for decision. The board of inquiry process allows for local input into the composition of the board as the Minister must seek suggestions for board members from the local authority.
- The capacity of those relevant local authorities.

In due course the members were appointed to the Board pursuant to s 149J of the RMA. It goes without saying that the Board is entirely independent of all those involved in the inquiry.

[46] One submitter alleged that the ‘call in’ process was undemocratic and lacking in legitimacy. Nevertheless, PC6 and the RWSS were referred to the Board pursuant to a statutory process and no further response on the Board’s part is required.

Statutory framework governing the inquiry

[47] The relevant statutory framework is contained in s 149J to s 149S of the RMA.

Preliminary steps

[48] Although PC6 had already been publicly notified by HBRC, s 149C required the EPA to give public notice of the Ministers’ Direction and to call for submissions on both PC6 and the RWSS. By the time the period for lodging submissions expired (2 August 2013), an additional 304 submissions had been received. Thus there are a total of 384 submissions before the Board, including the 80 submissions earlier received by HBRC.

[49] In accordance with s 149F, Hill Young Cooper Ltd then produced a summary of submissions²⁰ which runs into 665 pages, and that summary was duly notified by the EPA. Following notification of the summary of submissions persons meeting the s 149F(3) criteria had 10 working days to make further submissions. By closing date (30 August 2013) a further 22 submissions had been received.

²⁰ Summary of Submissions Plan Change 6: Hawke’s Bay Regional Resource Management Plan, prepared for the Tukituki Catchment Proposal Board of Inquiry, 14 August 2013.

[50] The Board records at this point that on 6 September 2013 Hawke's Bay and Eastern Fish and Game Councils (Fish and Game) asked the Board to arrange for an amended summary of the Fish and Game submissions to be prepared and notified. Underlying this request was an allegation that the summary already provided contained deficiencies. The Board declined the Fish and Game request on the basis that the summaries already provided were fair and accurate, not misleading, and that the requirements of s 149F(2) had been met.

Consideration and determination by the Board

[51] As to the conduct of the inquiry, s 149L provides:

- (1) A board of inquiry ... may, in conducting its inquiry, exercise any of the powers, rights, and discretions of a consent authority under sections 92 to 92B and 99 to 100 as if—
 - (a) the matter were an application for a resource consent; and
 - (b) every reference in those sections to an application or an application for a resource consent were a reference to the matter.
- (2) If a hearing is to be held, the board must—
 - (a) fix a place and the commencement date and time for the hearing; and
 - (b) give not less than 10 working days' notice of the matters stated in paragraph (a) to—
 - (i) the applicant; and
 - (ii) every person who made a submission on the matter stating that he or she wished to be heard and who has not subsequently advised the board that he or she no longer wishes to be heard.
- (3) A hearing must be held at a place near to the area to which the matter relates.
- (4) A board of inquiry—
 - (a) must keep a full record of any hearings or proceedings;
 - (b) may permit a party to question any other party or witness;
 - (c) may permit cross-examination;
 - (d) without limiting sections 39, 40 to 41C, 99, and 99A,—
 - (i) may direct that a conference of a group of experts be held;
 - (ii) may direct that a conference be held of submitters who wish to be heard at the hearing, the applicant, and any relevant local authority, or any of them.'

A hearing took place between 18 November 2013 and 21 January 2014. A full record of the hearing was kept and the transcript is publicly available on the EPA website.²¹

[52] Section 149P, which specifies how the Board is to go about considering the matter, relevantly provides:

- (1) A board of inquiry considering a matter must—
 - (a) have regard to the Minister's reasons for making a direction in relation to the matter; and
 - (b) consider any information provided to it by the EPA under section 149G; and
 - (c) act in accordance with subsection (2), (3), (4), (5), (6), (7), (8), or (9) as the case may be.
- (2) A board of inquiry considering a matter that is an application for a resource consent must apply sections 104 to 112 and 138A as if it were a consent authority.
-
- (4) A board of inquiry considering a matter that is a notice of requirement for a designation ...—
 - (a) must have regard to the matters set out in section 171(1) and comply with section 171(1A) as if it were a territorial authority; and
 - (b) may—
 - (i) cancel the requirement; or
 - (ii) confirm the requirement; or
 - (iii) confirm the requirement, but modify it or impose conditions on it as the board thinks fit; and
 - (c) may waive the requirement for an outline plan to be submitted under section 176A.
-
- (6) A board of inquiry considering a matter that is ... a change to a regional plan—
 - (a) must apply clause 10(1) to (3) of Schedule 1 as if it were a local authority; and
 - (b) may exercise the powers under section 293 as if it were the Environment Court; and
 - (c) must apply sections 66 to 70B and 77A to 77D as if it were a regional council; and
- ...

The Board has applied this section when considering and determining the matters before it.

²¹ www.epa.govt.nz/Resource-management/Tukituki/Hearing/hearing-proceedings

[53] As soon as practicable after completing its inquiry the Board is required to prepare a draft decision and report.²² Under s 149Q(2) the draft report:

- (a) must state the board's draft decision; and
- (b) must give reasons for the decision; and
- (c) must include a statement of the principal issues that were in contention; and
- (d) must include the main findings on the principal issues that were in contention; and
- (e) may recommend that changes be made to a plan, regional policy statement, national policy statement, or New Zealand coastal policy statement (being changes in addition to any changes that may result from the implementation of the draft decision); and
- (f) may recommend that a national policy statement, a New Zealand coastal policy statement, or a national environmental standard be issued or revoked.

Subsections (3) and (4) of s 149Q require the EPA to provide a copy of the draft report to specified persons who must be invited to comment on 'minor or technical aspects of the report' to the EPA not later than 20 working days after the date of the invitation.

[54] As soon as practicable after the 20 working day period expires the Board is required to consider any comments received, make its decision, and produce a final report.²³ Again the final report must include the information listed in the previous paragraph.²⁴

[55] The Board was required by s 149R(2) to produce its final report by 28 April 2014 which was nine months after the Ministers' Direction was notified.²⁵ However after the hearings concluded it became apparent that the Board could not complete a robust and comprehensive report (including the draft report which involved a 20 working day period for comment) within that time frame. Consequently the Board applied to the Ministers under s 149S for an extension of one calendar month. That

²² s 149Q of the Resource Management Act 1991.

²³ s 149R(1) of the Resource Management Act 1991.

²⁴ s 149R(3) of the Resource Management Act 1991.

²⁵ On 3 September 2013 the Resource Management Amendment Act 2012 (RMAA12), Section 149R (Board to produce final report) was amended to take account of normal RMA non-working days over Christmas/New Year holiday period in the nine month decision timeframe. The holiday period is a 22-day period starting on 20 December in any year and ending on 10 January in the following year.

extension was granted on 3 February 2014. Given the complexity of the issues and the voluminous information even this extended time frame was extraordinarily challenging.

[56] As soon as practicable after receiving notice of the Board's decision HBRC must; if the Board has approved PC6 (amended or otherwise); approve PC6 in its determined form and make it operative under s 149W(2)(b). In relation any resource consents granted or NoR confirmed the relevant consent authorities have the same functions, duties, and powers in relation to those matters that they would have had if they had granted the consents or confirmed the NoR themselves (s 149X of the RMA).

The pre-hearing phase of the inquiry

[57] While it was necessary for the Board to resolve numerous pre-hearing matters and issue 26 Board Minutes , this segment of the report is to be confined to matters that might be considered to be significant.

Directions as to procedure

[58] On 17 July 2013 the Board issued a comprehensive document specifying the time frames for various pre-hearing steps and outlining the procedures to be adopted at the hearing. In terms of the timetable:

- the applicants' evidence was to be provided by 6 September 2013;
- submitters' evidence was to be provided by 8 October 2013;
- the applicants' rebuttal evidence was to be provided by 8 November 2013.

Deadlines were also set for other matters including notification of an intention to cross-examine the witnesses of other parties.

[59] The Board acknowledges that these time frames were challenging for the applicants and submitters. A number of extensions of time for lodging evidence were granted. In some cases the extension was granted because expert witnesses had experienced delays in obtaining access to the proposed dam site (this is not a criticism of the land owner). All the extensions were for a short duration, and in each case the

Board was satisfied that other parties to the inquiry would not be prejudiced and the underlying timetable set by the Board would not be compromised.²⁶

Request for appointment of independent hydrologist

[60] On 12 September 2013 Mr Apple New Zealand Limited (Mr Apple), with the support of some other submitters, asked the Board to appoint an independent hydrology expert. This request was opposed by the applicants.

[61] When the request was made the time within which submitters were required to lodge their evidence had not expired and the Board declined the application primarily on the basis that it was premature.²⁷ The application was not renewed.

Assistance to submitters

[62] Alison McEwan of Langley Twigg Law, Napier, was appointed by the EPA as an independent 'Friend of Submitter'. Her role was to assist potential submitters upon request and the Board is grateful for the professional manner in which she discharged that role.

[63] During the submission period 3 public meetings were convened by the EPA during the submission period to enable interested persons to discuss the inquiry process. These meetings were held at Hastings on 15 July 2013, Waipawa on 9 July 2013, and Napier on 10 July 2013. All meetings were well attended. The Board acknowledges the important role played by EPA staff not only at those meetings but during the whole of the inquiry process.

Site visit

[64] On 17 October 2013 members of the Board visited the proposed dam site, travelled through irrigation Zones A–D and M, and then travelled down to the Tukituki River mouth at Haumoana. Accompanying the Board on the visit were EPA staff, a representative of the applicants (who was not involved in the proposal), Ms McEwan as

²⁶ Minutes recording these extensions can be found on the Board's website http://www.epa.govt.nz/Resource-management/Tukituki/Board_directions_communications/Board_directions_minutes/Pages/default.aspx

²⁷ Board Minute No.5 – Response to a request for an independent hydrologist, 23 September 2013.

the submitters' representative and Mark St Clair the independent planner appointed to assist the Board.

Facilitation meetings

[65] Facilitation meetings were held nightly between 15 and 21 October 2013 at the Opera House in Hastings and the Municipal Theatre in Waipawa. Commissioners from the Environment Court ran the meetings and the Friend of Submitter was in attendance. The meetings were generally well attended.

[66] These meetings were intended to facilitate open discussion, clarify matters for submitters, and where possible, enable issues to be narrowed or resolved. Some of the applicants' experts were available at the meetings to answer questions. Topics discussed at these meetings included economic and social effects of the RWSS, water science and hydrology (water quantity), engineering, aquatic and terrestrial ecology and amenity values and land and water science (water quality).

[67] The Board is grateful to the Commissioners for their leadership at these meetings.

Expert conferencing

[68] Expert conferencing was conducted by Commissioners from the Environment Court between 14 October 2013 and 24 October 2013. Again the Board is grateful to the Commissioners for the role they played and to the expert witnesses for their constructive approach to conferencing. This process enabled many issues to be resolved or narrowed whenever possible.

[69] Conferencing involved many topics including²⁸:

- water quantity and quality;
- ecology (terrestrial and aquatic);

²⁸ A facilitated session was also held on mana whenua matters.

- landscape;
- economics;
- coastal and estuarine matters; and
- planning.

Reports as to the outcome of the conferencing were provided to the Board and where necessary reference will be made to those reports in Parts 2 and 3.

[70] Following formal conferencing some experts were involved in informal conferencing both before and during the hearing process. Again this was a productive exercise which enabled further issues to be resolved or areas of dispute narrowed.

Pre-hearing conference

[71] A pre-hearing conference was held at the Hastings Opera House on 23 October 2013. It was attended by 16 lawyers (including Ms McEwan) and numerous submitters. The procedure the Board intended to adopt at the hearing was outlined and those present were invited to raise matters of concern. Three particular matters should be mentioned.

[72] First, counsel for Fonterra Co-operative Group Limited (Fonterra) and Dairy NZ Limited (Dairy NZ) suggested that submitters should have an opportunity to provide rebuttal briefs of evidence in response to the briefs of evidence that had been provided by other submitters. The Board agreed and directed that submitters would have until 30 October 2013 to provide rebuttal evidence. Fourteen rebuttal briefs were received.

[73] Secondly, the Board was asked by counsel for Fish and Game to seek a report from an independent expert as to the fitness for purpose of the Tukituki River Model (TRIM model) that had been used by Dr James (Kit) Rutherford, an expert witness for the applicants, to predict the effects of land use intensification on in-stream nitrogen and phosphorus concentrations. Issues concerning the TRIM model had been raised earlier

and discussed at a telephone conference.²⁹ Ultimately the Board declined to appoint an independent expert on the basis that the parties debating this particular issue were relying on the evidence of numerous experts to support or discredit the TRIM model. The Board considered that this evidence could be tested by cross-examination and that the appointment of a further expert was unlikely to assist.³⁰

[74] Finally, in response to an enquiry by counsel for the applicants, the Board confirmed that the rule in *Browne v Dunn*³¹ would not be used against parties who elected not to cross-examine witnesses. In other words, the hearing proceeded on the basis that the absence of cross-examination would not be construed by the Board as an acceptance of the opposing witness's evidence by the party electing not to cross-examine. Nor would it prevent a party asking the Board to prefer the evidence of that party's witness over the evidence of an opposing witness who had not been cross-examined.

The hearing phase

[75] One submitter asked for PC6 and the RWSS to be heard separately. The time frame within which the Board was required to operate meant that this was impossible. Apart from that there was a significant overlap between the evidence relating to each matter which also effectively ruled out any possibility of the hearing being split.

[76] At the commencement of the hearing phase the Board had before it:

- 5,329 pages of reports³² and other documentation relating to PC6 and the RWSS;
- submissions (including the summary of submissions) running into 6,053 pages;

²⁹ Board Minute No. 8 – Request for provision of information and extension of timeframe for submitter expert evidence reliant on TRIM Modelling, 7 October 2013.

³⁰ Board Minute 17 – TRIM Modelling, 8 November 2013.

³¹ *Browne v Dunn*, HL, 6 R 67, 1893.

³² An alphabetical list of these technical reports is included as Appendix 2 of Volume 2 of this report.

- 181 briefs of evidence from 131 witnesses totalling 6,853 pages.

During the hearing further documents (including 90 exhibits) presented to the Board totalled 6,326 pages. By the time the hearing concluded the Board had before it more than 28,000 pages of material.

[77] Before the hearing commenced the Board had read the documentation lodged in support of PC6 and the RWSS by HBRC and HBRIC, the submissions, further submissions, and the briefs of evidence. For the purposes of the hearing all the evidence was taken as read. Given the volume of evidence and the statutory time frame of 9 months the Board did not ask every witness to read his or her brief/s of evidence at the hearing. Consequently again due to volume and time, witnesses were only required to attend the hearing if they were to be cross-examined by another party or questioned by the Board.

[78] Essentially the hearing phase enabled witnesses required for cross-examination to present a concise summary of their evidence and to be cross-examined/re-examined. It also enabled submissions to be presented and representations to be made by submitters who wished to speak in support of their submissions. The hearing extended over 7 weeks. This was only achieved by the Board sitting over extended hours at times.

Venues

[79] The hearing commenced at the Opera House, Hastings, on 18 November 2013 and continued at that venue for the next three weeks (apart from one day). Hearings for the final two weeks before the Christmas vacation were conducted at the Municipal Theatre, Waipawa.

[80] Following the Christmas vacation the Board reconvened on 15 January 2014 at Matahiwi Marae, Hastings. On that day and the following day the Board heard evidence, submissions, and representations concerning cultural matters. The final three days of the hearing from 17 January to 21 January 2014 were held at the Municipal Theatre in Waipawa.

Format of the hearing

[81] In broad terms the following sequence was adopted:

- opening submissions on behalf of the applicants followed by cross-examination of their witnesses;
- oral representations/submissions by parties who were either supporting PC6 and/or the RWSS or taking a neutral stance, and cross-examination of their witnesses together with any closing submissions;
- oral representations/submissions by parties who were opposing PC6 and/or the RWSS, and cross-examination of their witnesses together with any closing submissions;
- closing submissions on behalf of the applicants.

Not surprisingly it was frequently necessary to interrupt this sequence to accommodate the availability of counsel, witnesses, and those making oral representations.

[82] As the hearing progressed and evidence was adduced and tested HBRC refined the notified version of PC6 (and where necessary amended its wording) to reflect points made by other parties that it accepted. This meant that the proposal changed during the hearing. While the changes settled many of the concerns of opposing parties, it also attracted criticism from some parties on the grounds that it was too much of a moving target. However we found the steps taken by HBRC and its planning consultant, Robert van Voorthuysen, most helpful as it focussed the debate on the outstanding matters and in our view did not pose an unreasonable burden on the submitters. As they emerged, the amendments were conveyed to all the parties via the website. This is a normal evolutionary process for an inquiry of this nature.

[83] We should also mention that a similar approach was adopted by HBRIC and Stephen Daysh, the company's consultant planner, in relation to the proposed conditions for RWSS. At the conclusion of the evidence, we were provided with an updated version of conditions HBRIC was prepared to accept. By and large the amendments to

the conditions arose from points that had been made by submitters during the hearing process.

[84] A summary of the Board's response to individual submissions concerning PC6 can be found at Appendix 3 of Volume 2 of this report.

Further conferencing of planning experts

[85] When Fish and Game opened its case on 12 December 2013 we were told that Helen Marr, its planning witness, intended to present a 'tracked change' version of PC6 when she gave evidence on 18 December 2013. Counsel for Fish and Game explained that this document was intended to assist the Board and that it had not been available to the Board or other parties at an earlier time because it included amendments that had arisen as the hearing had been progressing.

[86] Having heard from counsel who were present that day, the Board accepted that issues of procedural fairness might arise unless parties who had earlier elected not to cross-examine Ms Marr were given an opportunity to reconsider their position. So the Board instructed the EPA to ensure, first, that all parties were alerted to the document that Ms Marr intended to present, and secondly, the parties were given an opportunity to cross-examine Ms Marr about the document should they request to do so. Although some parties expressed disquiet about the situation that had arisen, no requests to cross-examine Ms Marr were received.

[87] During Trevor Robinson's (counsel for HBRC) cross-examination of Ms Marr on 18 December 2013 the Board identified that further conferencing between Ms Marr and Mr van Voorthuysen (and any other planners who wished to be involved) might avoid a protracted 'line by line' cross-examination of Ms Marr about her amendments to PC6. The Board were of the view that further conferencing between planners could assist in the drafting of any refinements to PC6 that might ultimately become necessary.³³

³³ Before the hearing started there was expert conferencing of planners on 21 October 2013 (16 planners) and 22 October 2013 (11 planners). Further conferencing occurred via email between 23 October and 1 November 2013.

[88] Following discussion with counsel and a brief retirement to consider the situation, the chairperson announced:³⁴

“We agree that all planners should be invited to participate in the conferencing, but as we see it, a leading role in organising the time and place should be undertaken by Ms Marr and Mr van Voorthuysen. That is simply to ensure that the conferencing takes place as quickly as is feasible.

And the next point concerns whether there should be a facilitated conferencing. Ideally, yes, and if Commissioner Oliver is available that would be excellent, however if the Commissioner is not available the time frames that we face in this inquiry mean that the conferencing would have to proceed regardless.

We anticipate that the conferencing will have to be concluded before the hearing resumes on 15 January and we anticipate that all planners who have [not] been involved in the process will be provided with a record of the outcome of the conferencing, ideally with an opportunity for those who have not attended to be able to provide their response.

The next issue is the question of hot-tubbing. In principle we agree with the idea of hot-tubbing, but whether or not that is necessary might, or almost certainly, would depend on the outcome of the conferencing. But in terms of approach the Board is comfortable with, and indeed supports, the idea of hot-tubbing.

The next point is that the conferencing will need to proceed on the basis of two possibilities – 1) that the Board accepts the single nutrient approach; 2) that the Board adopts a dual nutrient approach.”

Leave was reserved to the applicants to continue their cross-examination after the conferencing had concluded, if they so wished. Fish and Game was also permitted to defer its closing until the cross-examination of Ms Marr had finished.

[89] Again this development was brought to the attention of other parties who were invited to participate in the additional conferencing of planners. Some parties expressed concern about the situation, and we will return to that matter in a moment.

[90] The additional conferencing took place under the supervision of an Environment Court Commissioner on 7 and 8 January 2014, with five planners participating.³⁵ A report as to the outcome dated 10 January 2014 was provided to the Board. While

³⁴ Tukituki Catchment Proposal Hearing Transcript, pages 2720 – 2721.

³⁵ One planner was only able to be present for a short time on 7 January 2014 at the beginning of the conference.

limited progress was made, the conferencing did result in HBRC proposing a nitrogen cap.³⁶ The possibility of ‘hot-tubbing’ the planners was not taken any further.

[91] In the meantime some parties had expressed concern about the inability of their planners to participate in the conference. This matter (as well as several other matters) was discussed during a telephone conference between the chairperson and counsel on 13 January 2014.³⁷ All parties were given until 17 January 2014 to provide a written response to the conferencing report. A few parties provided a response.

[92] Before leaving the issue of conferencing by planning experts the Board would like to express its gratitude for the effort made by all planners to sort out their differences and help the Board concentrate on the many important matters requiring determination. It is acknowledged that a number of planners interrupted their Christmas holidays to meet on 7 and 8 January 2014. The Board recognises that in some cases the stance adopted by the planners depended on the views of other experts who remained in disagreement on numerous matters. Under those circumstances it is not surprising that the planners could not achieve full agreement, but the Board acknowledges the genuine effort they made to resolve as many matters as possible.

Planning report

[93] During the hearing the Board requested Mr St Clair provide a planning report on various issues pursuant to s 41C(4) of the RMA. As required by that section the applicants were notified before the report was commissioned and consented to it being obtained.

[94] The report was presented to the Board on 6 January 2014. Although all parties were provided with an opportunity to question Mr St Clair about his report, no requests were received and it was unnecessary for Mr St Clair to attend the hearing. However, a few parties provided a written response to his report.

A last moment development

³⁶ Expert Conferencing Joint Witness Statement to the Board of Inquiry — Planners (Change 6) Second Statement, 10 January 2014.

³⁷ Board Minute 23 – Response to conferencing of Planners and other matters, 13 January 2014.

[95] Just before the hearing closed on 21 January 2014 the Board was informed that ongoing discussions between the applicants, Ngāti Kahungunu Iwi Incorporated (NKII), Te Taiwhenua o Heretaunga (Heretaunga)³⁸ and Te Taiwhenua o Tamatea (Tamatea) had been productive. We should explain that NKII and Heretaunga opposed PC6 and the RWSS on the basis (amongst other things) that they had not been properly consulted. On the other hand Tamatea supported both the plan change and storage scheme.

[96] A joint memorandum (Joint memorandum of counsel, 21 January 2013) signed by counsel for the three parties and dated 21 January 2014 was presented to the Board. The memorandum stated that all parties agreed that a “constructive and enduring relationship” between the parties was important. HBRC acknowledged that re-engaging with Te Taiwhenua o Heretaunga, Ngāti Hawea ki Matahiwi Marae, Waimarama Marae, Operation Patiki (Kohupatiki Marae), Waipatu Marae, Ngāti Hawea, Ngāti Hori, Ruahapia Marae, and Ngai Te Upokoiri ki Omahu Marae (which we collectively refer to as Heretaunga) and NKII would require kanohe-ki-te-kanohe, pokohiwi-ki-te-pokohiwi (face-to-face, shoulder-to-shoulder) engagement at governance level of HBRC with NKII and Heretaunga, including hapū and marae level.

[97] As a first step the parties had met on 20 January 2014 to discuss discrete amendments to PC6 and the RWSS consent conditions. Modified and/or new provisions relating to PC6 and the RWSS consent conditions were attached to the joint memorandum. It was explained that it had not been possible to seek the views of the marae and hapū of Heretaunga, or to address the full range of issues raised by NKII and the Heretaunga parties during the hearing process.

[98] The memorandum stated that NKII and Heretaunga were still in the process of completing their review of the independent planner’s report and the report arising from the second planners’ conference. They sought the Board’s leave to file a response to those documents. Given that a deadline had been set for all parties to respond to both those documents by 17 January 2014 and in the absence of any compelling explanation for failure to meet that deadline, the Board refused leave.

³⁸ Heretaunga presented the case for six marae (Ngāti Hawea ki Matahiwi Marae (Matahiwi Marae), Waimarama Marae, Operation Patiki (Kohupatiki Marae), Waipatu Marae (Ngāti Hawea, Ngāti Hori) Ruahapia Marae, Ngāti te Upokoiri ki Omahu Marae) at the hearing and the document referred to Heretaunga and these marae collectively as “the Heretaunga parties”.

[99] It was also flagged in the joint memorandum that NKII, and Heretaunga and Tamatea intended to update the Board by 8 February 2014 about ongoing discussions on the matters identified in the memorandum. On 8 February 2014 counsel for the applicants, NKII, and Heretaunga provided a further memorandum reporting agreement on various matters. Counsel for Tamatea lodged a memorandum dated 11 February 2014 reporting that Tamatea was supportive of the contents of the joint memorandum dated 8 February 2014.

[100] The Board applauds steps that are being taken by the parties to cement an ongoing relationship. However, the late stage at which the memoranda were received prompted the Board to turn its mind to issues of procedural fairness. By the time the documents were received it was not feasible for the Board to obtain the views of other parties. Having pondered the issue of procedural fairness the Board decided that it was safe to take the memoranda into account.

[101] This conclusion reflects several factors. Firstly, one way or the other the matters referred to in the memoranda had been flagged during the hearing. Secondly, all parties directly affected by those matters were involved in the memoranda and supported the proposed amendments to conditions. Finally, no parties to the proceeding will be prejudiced if the board takes the proposed amendments into account.

The Board's approach to several matters

[102] The following matters are addressed at this stage because they concern both PC6 and the RWSS.

Necessity to determine PC6 first

[103] By the end of the hearing it was largely common ground that as a matter of principle the Board needed to assess and determine PC6 before it considered the RWSS.³⁹ In other words, PC6 will have to stand on its own feet and satisfy the tests under of the RMA regardless of whether the RWSS (or any other irrigation scheme) proceeds.

³⁹ Although one submitter sought to have finalisation of PC6 deferred until the RWSS had been resolved.

[104] Pursuant to s 86B(3) as the PC6 rules relate to water, they are deemed to have immediate legal effect from the date on which PC 6 was notified, that is 4 May 2013.

[105] Tthe RWSS can then be considered within the framework of that plan change as finally determined by the Board. However given that PC6 will at that stage only be a *proposed* plan change (because it will not have been made operative under s 149W(2)(b)) the Board will have to decide the weight that should be given to it and what weight should be given to the operative rules when applying s 104(1)(b) (vi) and s 171(1)(a) (iv) of the RMA.

[106] When assessing that matter the Board adopts the approach explained by the Environment Court in *Keystone Watch Group v Auckland City Council*.⁴⁰ By the time the Board has determined PC6 it will have been through the inquiry process and subjected to critical scrutiny by this Board. While the Board has recognised that its decision on PC6 is subject to appeal to the High Court on points of law (and subject to leave, to the Supreme Court),⁴¹ the provisions of PC6 seek to implement the NPSFM in the very catchment in which the RWSS is to be constructed. The Board is satisfied that PC6 should carry considerable weight when the RWSS is assessed.

Weight to be given to other instruments

[107] When the inquiry began there are two proposed plan changes (apart from PC6) involving the Hawke's Bay region. In both cases HBRC had issued its decisions on submissions during 2013 and the proposed plan changes were appealed to the Environment Court. Both involve changes to the regional policy statement. Plan Change 4 (PC4), which introduces new provisions relating to the management of the 'Built Environment' within the region, became operative on 1 January 2014. However, the objective and policies that are potentially relevant are unlikely to have any influence on the outcome of PC6 or the RWSS.

[108] Plan Change 5 (PC5), which relates to the integrated management of water and land, is designed to assist in implementing the NPSFM. It also has a direct bearing on

⁴⁰ *Keystone Watch Group v Auckland City Council*, NZEnvC Akld, (A7/2001), 11 January 2001, Whiting J at [45].

⁴¹ s 149V of the Resource Management Act 1991.

cultural matters. Obviously it is highly relevant to the issues to be resolved by the Board. Equally importantly PC5 is a ‘proposed regional policy statement’ which the Board must have regard to under s 66(2)(a).

[109] Naturally the Board is mindful that appeals to the Environment Court are still pending in relation to PC5. However the Board was provided with information about the progress of those appeals, including the outcome of mediation in relation to some of the appeals. Taking into account that information and the high relevance of PC5 to the matters before the Board, it has decided that PC5 should receive considerable weight when PC6 and the RWSS are assessed.

[110] Another document that should be mentioned is the proposed National Environmental Standard on Ecological Flows and Water Levels (pNES EFWL) which was first published in March 2008. While five years have passed without the document having been formally adopted, the Board has decided that this document should receive some weight because it is directly relevant to one of the issues to be decided by the Board and can be taken as representing at least a preliminary view at a national level. It is noted, however, that this Environmental Standard is currently on hold pending decisions on the 2013 freshwater reforms concerning the NPSFM.

[111] In November 2013 the NZ Government released a discussion document entitled ‘Proposed amendments to the National Policy Statement for Freshwater Management 2011’. While the Board notes the existence of the document and its intent if implemented, it is nothing more than a discussion document. Given the direction in the RMA to have regard to National Policy Statements, we see a ‘discussion document’ being one step further removed and the Board gives no weight to the discussion document.

Burden/standard of proof

[112] Several parties advanced submissions concerning the burden and standard of proof under the RMA. This topic can be addressed quite briefly because, as the Board sees it, most of the significant issues revolve around the Board’s assessment of conflicting evidence, much of that evidence being of an expert nature. Put another way,

the outcome will reflect the Board's assessment of the evidence rather than matters of proof.

[113] The Board accepts that as a general rule the party asserting must prove. It is not enough for a party to simply 'put up' an issue without any probative evidence (or other supporting information) on the basis that opposing parties will have to disprove it. See for example, *Heybridge Developments Limited v Bay of Plenty Regional Council*.⁴²

[114] It is also accepted by the Board that the applicable standard of proof is the balance of probabilities, although there is a generous degree of flexibility depending on the seriousness of the allegation. Refer to *Royal Forest and Bird Protection Society v Buller District Council*.⁴³

Lay v expert evidence

[115] By virtue of s 41 of the RMA specified parts of the Commissions of Inquiry Act 1908 apply to this inquiry. These include s 4B which permits the Board to:

“...receive as evidence any statement, document, information, or matter that [our] opinion may assist [us] to deal effectively with the subject of the inquiry, whether or not it would be admissible in a Court of law.”

Thus the Board has flexibility when it comes to receiving information. For that reason we allowed submitters, especially lay submitters, a good deal of latitude.

[116] Adopting a similar approach in *Re Meridian Energy Limited*⁴⁴ the Environment Court observed:

“A considerable amount of latitude was permitted to the submitters representing themselves to admit otherwise inadmissible evidence on the basis that the Court would be able to effectively sift the wheat from the chaff and determine what weight should be given to the evidence in contention on a particular topic.”

⁴² *Heybridge Developments Limited v Bay of Plenty Regional Council*, HC Tauranga, CIV 2010-470-585, 19 August 2011, Peters J, at [49] and [51].

⁴³ *Royal Forest and Bird Protection Society v Buller District Council*, HC Christchurch, CIV 2005-485-001240, 21 December 2005, at [73].

⁴⁴ *Re Meridian Energy Limited*, ENV Christchurch-2011-90, 15 April 2013, at [60].

The Court went on to say⁴⁵ that where there is a need for risk assessments about future effects on the environment both expert and lay evidence can often assist.

[117] Rather than attempting to lay down any hard and fast rules the Board prefers to approach the evidence and other information before it on the basis that the Board will have to exercise its own judgement when determining weight. Of course where the knowledge and expertise of an expert witness clearly outweighs that of a lay person the outcome will be obvious. On the other hand there are situations where, although the evidence of the lay witness might not come close to being admissible under s 25 of Evidence Act 2006, of this inquiry it reflects local knowledge or experience that justifies considerable weight.

Independence of expert witnesses

[118] Submissions were presented about whether the evidence of expert witnesses who could not be regarded as *independent* because they were also submitters should receive less weight than the evidence of independent experts. Quite a number of highly qualified experts who were also submitters made representations or gave evidence.

[119] We note that similar reverse questions were levelled at the independence of expert witnesses employed by HBRC and HBRIC.

[120] Again the Board declines to adopt hard and fast rules. Whether or not the evidence of the independent expert is preferred over that of an expert who could not be regarded as independent will depend on the Board's assessment of the evidence.

Other matters

[121] Some submitters complained that the time frame for lodging submissions was too short and in some cases an extension of time was sought. The time within which submissions are to be made is set by s 149E(9) of the RMA. There is no power for the Board to extend that time frame. When presenting a representation on behalf of the Te Taiao Hawke's Bay Environmental Forum, John Cheyne recommended that

⁴⁵, at [67].

consideration of PC6 should be deferred until the Environment Court determines PC5. Again, that was not a feasible possibility.⁴⁶

[122] Another submitter, Dr Christine Cheyne, an Associate Professor of Resource Environmental Planning at Massey University, considered that the Tukituki Catchment Proposal had attracted a relatively small number of submissions for a nationally significant proposal. This prompted her to comment:⁴⁷

“From my professional expertise, which includes 24 years of research, including a doctoral thesis on public participation and local authority planning processes, I am aware that this lack of public participation is due to the nature of the process. For most participants in the process it is daunting, alienating in its complexity, financially prohibitive and exclusionary for people who do not have the resources of time, skills, knowledge and time to participate.

Recent legislative changes designed to simplify and streamline environmental decision making processes have made the processes less accessible. The tight timeframe for this inquiry, while not chosen by the Board, have compounded difficulties for many participants. The combined effect of the numerous barriers for public participation means that much information about community values, not just in relation to water but also in relation to terrestrial indigenous biodiversity and landscapes as well as freshwater objectives, is patchy at best and likely to be distorted or flawed at worst.

But it is not just information about community values and freshwater objectives that is lacking, the lack of resources available for participation by most parties other than those hired or employed by the applicant has been a growing concern by many who have resourced their own participation or who have had to exclude themselves because of the lack of resources. This lack of engagement means that important information and expertise in a range of areas has not been able to be made, and I think specifically of the reliance of the Board on information from Forest and Bird and Te Taiao which are two community NGOs, and their experts, for which they had very limited funding, that’s an example of where I think information before the Board will be not as good quality as it needs to be because of the lack of resourcing.”

While the Board respects those views, it is satisfied that in this particular inquiry all points of view were robustly and comprehensively addressed and the Board has sufficient information to enable it to resolve the issues before it.

[123] Finally one submitter, Ngaputerangi Te Whaiti, invited the Board to stand down on the basis that⁴⁸:

⁴⁶ J Cheyne, Tukituki Catchment Proposal Hearing Transcript, page 1776.

⁴⁷ C Cheyne, Tukituki Catchment Proposal Hearing Transcript, page 3359.

⁴⁸ N Te Whaiti Tukituki Catchment Proposal Hearing Transcript, page 2976.

“I, as an individual, as a marae, whanau, hapu and iwi member of Ngati Kahungunu have never relinquished my rights and interests in water, minerals and other resources to the Crown.”

Mr Te Whaiti wanted the Board to stand down so that members of the Ngāti Kahungunu Nation could “take their rightful place in the decision making process and as Treaty Partners to the Crown”. Having been appointed to discharge a statutory function the Board intends to fulfil that role. The Board declines Mr Te Whaiti’s invitation.

A theme

[124] The Board concludes this part of the report by noting that a theme running through the inquiry is the need for change in the management of land and water resources within the Tukituki catchment. As the Ministers commented when referring the matter to the Board, PC6 “involves methods of water and land management that are new to New Zealand”. It is also clear that a water storage proposal on the scale contemplated, and the associated water and land management regime, would be new to New Zealand.

[125] Late last year Dr Jan Wright, Parliamentary Commissioner for the Environment, released her report on water quality. She said⁴⁹:

“When this investigation began, I hoped the modelling would provide happier news. In much of my work, I actively seek out ‘win-wins’ for the economy and the environment. But in this case, New Zealand does face a classic economy versus environment dilemma. Despite the thousands of academic papers that have been written about ‘internalising’ environmental costs into the economy, its practice largely eludes us. While, ‘polluter pays’ is a logical extension of ‘user pays’, its implementation is fraught with many challenges.”

The Commissioner then referred to the NPSFM and observed that the goal of improving freshwater cannot be achieved unless decision-makers more actively address the link between land use changes and water quality.

⁴⁹ Parliamentary Commissioner for the Environment, Water quality in New Zealand: Land use and nutrient pollution, November 2013, page 7.

[126] The NPSFM took effect on 1 July 2011. According to the preamble it “is a first step to improve freshwater management at a national level” and:

“Given the vital importance of freshwater resources to New Zealand and New Zealanders, and in order to achieve the purpose of the Resource Management Act 1991 ... the Crown recognises there is a particular need for clear central government policy to set a national direction, though the management of the resource needs to reflect the catchment-level variation between water bodies and different demands on the resource across regions. This includes managing land use and development activities that affect water so that growth is achieved with a lower environmental footprint.”

As to water quality the objectives expressed in the Policy Statement include safeguarding the life supporting capacity of freshwater and the maintenance or improvement of the overall quality of freshwater within a region and water quantity objectives include safeguarding the life supporting capacity of freshwater and the avoidance of any further over-allocation.

[127] Under s 67(3)(a) of the RMA a Regional Plan *must* give effect to any National Policy Statement. The Board is required to ensure that this requirement is met by PC6. Most of the parties involved in the inquiry accepted that, within reason, attitudes towards managing the inter-relationship between land use and freshwater need to change. Indeed, the representations and evidence the Board heard from various sector groups suggests that this is already happening.

[128] Understandably effects arising from intensification of land use, particularly an increase in dairy farming, raise concerns on the part of those supporting improved water quality. Recognising those concerns, counsel for Fonterra and Dairy NZ observed⁵⁰:

“Over the past several decades, New Zealand has seen a period of rapid growth of dairy farming throughout the country, and this growth has contributed greatly to the economic and social wellbeing of many rural communities. But this growth has, at times, lacked an integrated and effective approach to monitoring and managing the effects of dairy farming. That must change.”

Counsel told the Board that both Fonterra and Dairy NZ are firmly of the view that both regulators and the dairy industry have a responsibility to ensure that future growth of dairy farming occurs in a sustainable way.

⁵⁰ Fonterra and Dairy NZ, Legal Submissions, paragraph 6.

[129] The Board agrees. Managing intensification of land use in a sustainable way reflects the underlying philosophy of the RMA, the promotion of sustainable management of natural and physical resources.

PART 2

PLAN CHANGE 6

Introduction

[130] Part 2 begins by outlining some of the events that led to HBRC adopting and notifying PC6. A description of the proposed plan change as notified and an outline of the statutory context within which it needs to be assessed follows. After identifying the principal issues in contention the Board assesses those matters and arrived at its findings.

Development of PC6

[131] According to HBRC the development of PC6 involved four sequential steps which are described in the Council's s 32 Evaluation Report⁵¹:

- “i. Identifying catchment values;
- ii. Identifying the management objectives having regard to those freshwater values;
- iii. Identifying a full range of management options (including policy responses) in relation to those freshwater values and selecting the most appropriate option based on an objective comparison of the advantages and disadvantages of each;
- iv. Implementing the selected option and monitoring its performance in terms of appropriately managing the freshwater resources in relation to the identified freshwater values.”

The following summary, which is largely derived from Ms Codlin's brief of evidence, provides a context for those steps.

[132] After holding a series of internal workshops, HBRC identified 14 strategic issues⁵² which were then developed into draft strategic goals and objectives. In due

⁵¹ H Codlin and R van Voorthuysen, Section 32 Evaluation Summary Report for proposed Plan Change 6 Tukituki River Catchment, adopted by council on 24 April 2013, Folder 1 of Plan Change application documents, Tab 3, page 11.

⁵² These issues were under the headings of Sustainability, Water Futures, Land Use Change, Climate Change, Renewable Energy, Future Regional Infrastructure, Open Space, Economic Development, Regional Futures

course these goals and objectives were incorporated into a document Embracing Futures Thinking which was used throughout 2008 for discussion with stakeholders and the general community.

[133] In its Long Term Plan 2009–19 HBRC gave priority to six key areas: water, land, climate change, regional infrastructure, investments, and regional leadership. Then HBRC set about developing future scenarios for the region which involved interviews with community leaders and a three day workshop. This led to a report HB2050 Land River Us which outlined possible future scenarios.

[134] These scenarios were discussed at a two day regional water symposium in November 2010⁵³ which was attended by 114 people representing 42 organisations and businesses. Values held by the community for water in the region's seven main catchments were also discussed. A multi-party reference group was established to assist with the development of a strategy for the management of land and water in the region.

[135] A year later a strategic document concerning land and water management was presented at a further symposium held in November 2011.⁵⁴ This symposium was attended by 125 people with 35 businesses and organisations being represented.

[136] Following further studies HBRC released a consultation document Tukituki Choices in September 2012. This document set out HBRC's vision for the catchment, issues affecting the catchment, values and objectives that had been identified, and the tools available for managing land and water in the catchment. It contained four options for the community to consider and evaluated the effects for each option.

[137] A five week consultation period over September and October 2012 was extended by 10 days following concern in the community that the period originally allowed was too short. During the consultation period senior HBRC staff made presentations at three

Scenarios, Regional Leadership, Partnership with Māori, Investment, Operational Activities and Organisational Competency (H Codlin, Evidence in Chief, paragraph 6.1).

⁵³ H Codlin, Evidence in Chief, Paragraph 6.5 — Hawke's Bay Regional Water Symposium Event Report December 2010 HBRC Plan No.4245.

⁵⁴ H Codlin, Evidence in Chief, Paragraph 6.5 — Hawke's Bay Regional Water Symposium Event Report December 2011 HBRC Plan No. 4296.

public meetings and two breakfast sessions. Responses were received from 164 organisations/individuals.

[138] At its meeting on 31 October 2012 HBRC endorsed a strategy for the catchment based on⁵⁵:

“(a) Setting water quality limits to maintain the mauri and life supporting capacity of freshwater bodies and associated ecosystems.

(b) Setting water allocation limits as generally outlined in the Tukituki Choices discussion document.

(c) Setting minimum flow limits based on 90% habitat protection for longfin eel for Waipawa River at SH 2 and Tukituki at Tapairu Rd, transitioning from current over a 3-5 year period.

(d) Setting minimum flows for Tukituki at Red Bridge based on 90% habitat protection for trout, transitioning from current over a ten year period.

(e) Allowing applications to be lodged to take water for community irrigation schemes over and above the core allocation limits.

(f) Setting in stream phosphorus targets as a means of reducing periphyton growth.

(g) Managing nitrogen for nitrate toxicity based on a 95% protection threshold for zone 1, and the 90% protection threshold for zones 2, 3 and 5. The 90% species protection level correspond to a very low risk of a minor effect on trout and a negligible risk of insignificant effect on native fish and invertebrate species and are thus considered environmentally conservative.

(h) Setting nitrogen and phosphorus limits based on current in-stream nitrate and phosphorus levels for Zone 4.

(i) Reviewing land management policies and practices and regulatory approaches.”

In due course PC6 was promulgated and publicly notified.

Plan Change 6 as notified

[139] The Board summarise PC6 as notified under four headings: objectives, policies relating to water quality, policies relating to water quantity, and rules. When dealing

⁵⁵ H Codlin and R van Voorthuysen, Section 32 Evaluation Summary Report for proposed Plan Change 6 Tukituki River Catchment, adopted by council on 24 April 2013, Folder 1 of Plan Change application documents, Tab 3, page 6.

with those matters some of the matters in contention will also be touched on, albeit without going into any detail at this stage.

The Objectives

[140] For the purpose of this summary the description of the PC6 objectives contained in the s 32 Evaluation Report is adopted:⁵⁶

“Objective TT1 sets out the freshwater management objectives for the instream values of the Tukituki River catchment.

- Sub-objective (a) seeks to manage river flows and water quality for the habitats and health of native fish (important to tangata whenua), trout (important to recreational fishers), and also the macro-invertebrates that those fish feed on. Sub-objective (a) gives effect to Objectives A1 and B1 of the NPSFM and OBJ LW1(4) of RPS Change 5.
- Sub-objective (b) focuses on safe contact recreation. It will require microbiological indicator bacteria to be at levels that avoid people becoming ill following contact with river water.
- Sub-objective (c) deals with periphyton (algae and slimes). The focus is on managing excessive periphyton growths that are problematic for recreational use and amenity, recognising that the rivers in the Tukituki River catchment (and Hawke’s Bay rivers generally) are subject to natural growths of periphyton throughout the catchment and so its elimination is not a practical objective.
- Sub-objective (d) deals with the protection of significant values of natural wetlands, consistent with Objective A2(b) and Objective B4 of the NPSFM. The emphasis on the protection of those values recognises the loss of wetlands that has occurred to date within the Tukituki River catchment (and Hawke’s Bay generally) and the subsequent importance of remnant natural wetlands. Sub-objective (d) gives effect to Objective 15A of the RPS and is implemented through existing provisions in the RRMP.
- Sub-objective (e) deals with the mauri of the Tukituki River catchment’s rivers and groundwater. Mauri is an important concept for tangata whenua, but in order to provide meaningful guidance to decision makers, the objective relates to aspects of water quality and quantity that contribute to mauri. This will facilitate decision makers ensuring that adverse effects on those aspects are managed appropriately. Sub-objective (e) gives effect to Policy 57 of the RPS.

Objective TT2 requires degraded water quality to be improved over time, as required under Objective A2(c) of the NPSFM.

Objective TT3 focuses on the very high value placed on groundwater for human consumption and stock drinking water. This reflects the priority afforded to those activities in section 14(3)(b) of the RMA and also the Resource

⁵⁶ H Codlin and R van Voorthuysen, Section 32 Evaluation Summary Report for proposed Plan Change 6 Tukituki River Catchment, adopted by council on 24 April 2013, Folder 1 of Plan Change application documents, Tab 3, page 15.

Management (National Environmental Standards for Human Drinking Water) Regulations 2007. If, as a first priority, degradation that compromises those values cannot be avoided, then the adversely affected water supplies will need to be treated or alternative water supplies provided. State of the Environment groundwater monitoring indicates that groundwater is currently within guidelines. (Gordon 2013). Shallow groundwater monitoring undertaken in 2008 and 2012 has indicated elevated levels of some parameters.

Objective TT3 also gives effect to OBJ LW1(5) of the RPS.

Objective TT4 recognises that current reliability of supply for abstractors (particularly irrigation abstractors) is low. However, in order to maintain or enhance instream values in Objective TT1, minimum flows (river flows at which abstractions must cease) are proposed to be increased and this will further reduce current reliability of supply. To mitigate the impact of the reduced reliability of supply, any applications for new water takes will a non-complying activity while community irrigation schemes and high flow harvesting applications will be discretionary activities. Any water that is not required by existing abstractors will not be re-allocated to other users.

Objective TT4 gives effect, at least in part, to Objectives B2 and B3 of the NPSFM.

Objective TT5 recognises that one response to the water short nature of the Tukituki River catchment (as enunciated by Objective TT4) is the development of Community Irrigation Schemes, such as the Ruataniwha Water Supply Scheme (RWSS) being promoted by HBRC. Such schemes have the potential to meet broader economic wellbeing objectives and assist towards environmental objectives. Provided that freshwater management objectives TT1 to TT3 can be met, then such schemes should be enabled. This approach is consistent with section 5 of the RMA. (Objective TT5 gives effect to POL LW1(k) of RPS Change 5.)”

Many of the matters raised by submitters were resolved at the first planners conference on 21 and 22 October 2013. As a result two new objectives TT1(ba) and TT4A were inserted and TT3 was deleted.

[141] Two particular issues that remain contentious should be mentioned.

[142] First, Fish and Game, supported by the Environmental Defence Society Inc (EDS), seeks the inclusion of an objective stating the freshwater values that are to be recognised and provided for. HBRC and others oppose inclusion of such an objective on the basis that it is unnecessary.

[143] Secondly, there is widespread support among the rural community for inclusion of an objective relating to the taking and use of water for primary production and the processing of beverages, food and fibre. While inclusion of such an objective is not

strongly opposed, there are differing views about its wording and whether it should be subservient to environmental objectives.

[144] The Board should also record that CHBDC sought inclusion of an objective stating that the adverse effects of existing community wastewater discharges would be managed through the use of best practicable options. However, it was agreed by the planners participating in the second conference of planners (including Sylvia Allan, the planner for CHBDC) that it should be included as a policy rather than an objective. The Board agrees.

Policies relating to water quality

[145] Management of water quality is based on the five zones shown on the following map which forms part of PC 6 (Figure 3).

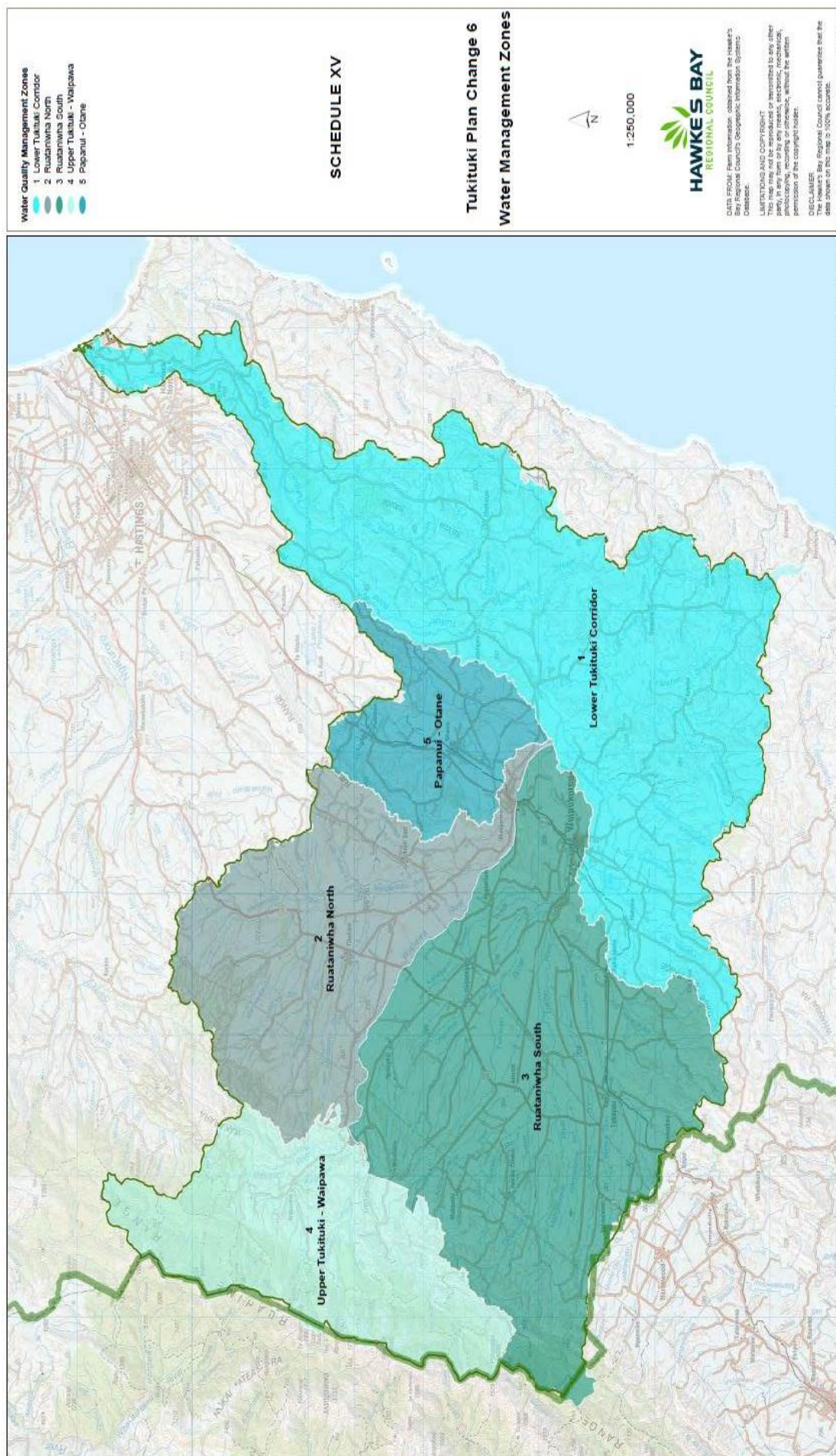


Figure 3: Map of Plan Change 6 Water Management Zones

While some of the water quality parameters described in the policies apply across all these zones, others are zone specific.

[146] Policies TT1 to 6 (and the associated tables) relate to water quality. Amongst other things these policies/tables set limits or targets for temperature, dissolved oxygen, *Escherichia coli* (E.coli), nitrogen,⁵⁷ and phosphorus.⁵⁸ For other toxicants a 95 percent species protection level is set.

[147] More specifically TT1 sets surface water standards, TT2 standards for groundwater, and TT3 standards for point discharges of which the Waipukurau and Waipawa waste water discharges are the most significant. Policy TT4 implements the nitrate nitrogen limits and TT5 the phosphorus limits and targets. The remaining policy (TT6) contains decision-making criteria for land use consents.

[148] Standards for nitrate nitrogen under TT4, which are set at levels that are designed to avoid toxicity effects on aquatic fauna, are to be implemented by a series of steps. These steps include requirements for farmers to keep records so that Nutrient Budgets can be prepared, establishing 'industry good practice' leaching rates which are to be included in the RRMP by mid 2018, and the preparation of Nutrient Budgets. In certain situations land use consents are required where nitrate-nitrogen limits are exceeded.

[149] Recognising that phosphorus is a particular problem in the middle and lower catchment, Policy TT5 provides regulatory and non-regulatory methods by which that contaminant is to be controlled. Regulatory methods include exclusion of livestock from rivers and streams and phosphorus management plans for farms. Non-regulatory methods include advisory services and monitoring. In 2020 and 2025 HBRC will review whether there is a need for a more intensive regulatory regime.

[150] One of the most contentious issues facing the Board is whether there should be a single or dual nutrient approach to the management of periphyton. PC6 proceeds on the basis that reducing phosphorus inputs into rivers and streams is the most effective

⁵⁷ Total ammoniacal nitrogen (TNH₃-N), nitrate-nitrogen (NO₃-N), and dissolved inorganic nitrogen (DIN).

⁵⁸ Dissolved Reactive Phosphorus (DRP).

mechanism for managing nuisance periphyton and in-stream controls on nitrogen are not required for that purpose (except in Zone 4 which covers the upper reaches of the catchment).

[151] Many submitters consider that this philosophy is fundamentally flawed and that the management of *both* phosphorus and nitrogen is essential to control excessive periphyton (and preserve the health of the rivers and streams in the catchment). An instream limit of 0.444mg/l for dissolved inorganic nitrogen (DIN) (over time) is sought by EDS, Fish and Game, and the Royal Forest and Bird Protection Society of New Zealand Inc (Forest and Bird). That limit has widespread opposition from farming interests who believe that it would put them out of business.

Policies relating to water quantity

[152] Water quantity revolves around two inter-related matters, first, minimum river flows and, secondly, the allocation of surface water and groundwater for irrigation purposes.

[153] The following maps (Figures 4 and 5) form part of PC6. The first map shows surface water allocation zones and the sites at which minimum flows apply (Figure 4). The second map shows groundwater allocation zones (Figure 5).

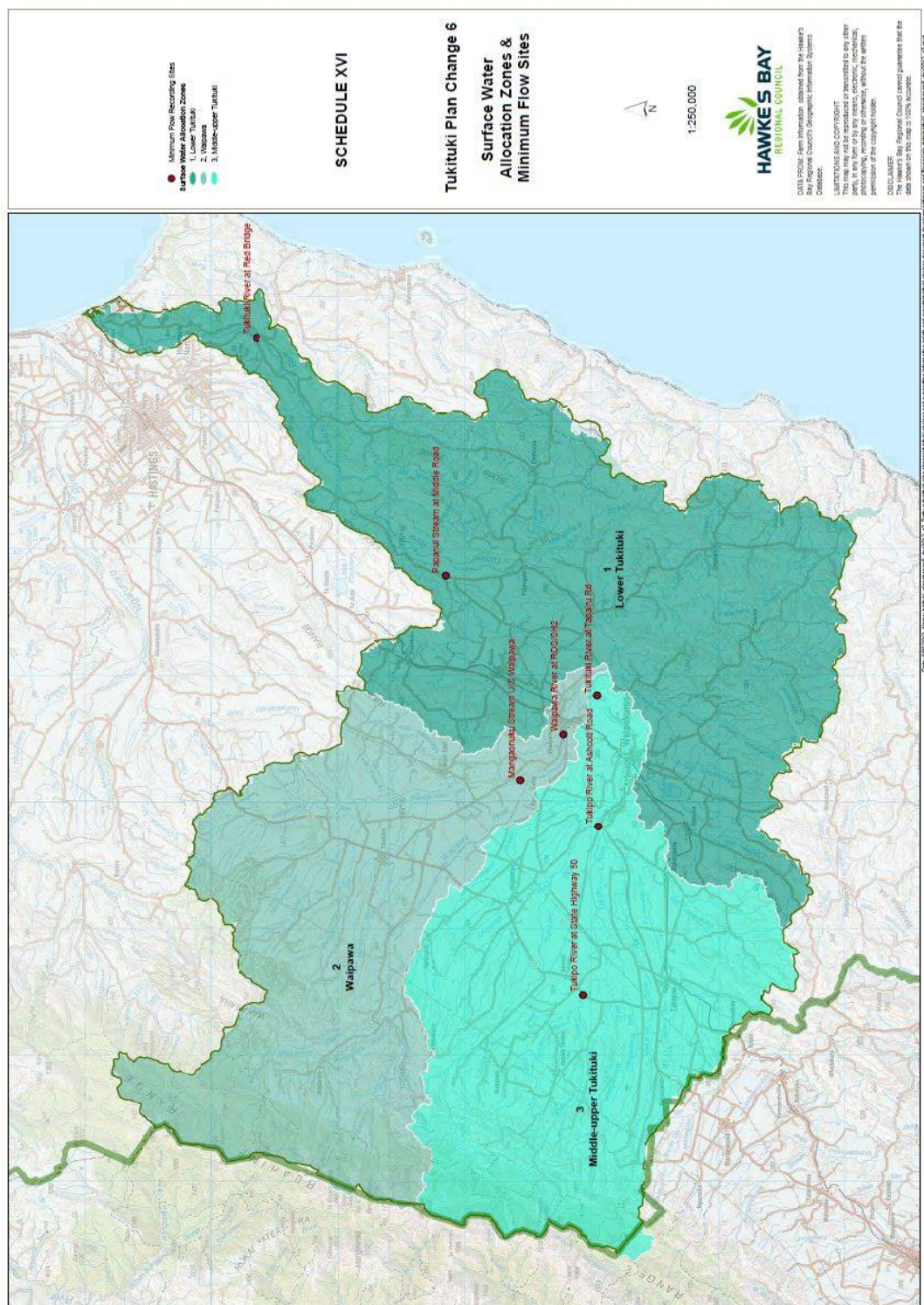


Figure 4: Surface Water Allocation Zones and Minimum Flow Sites

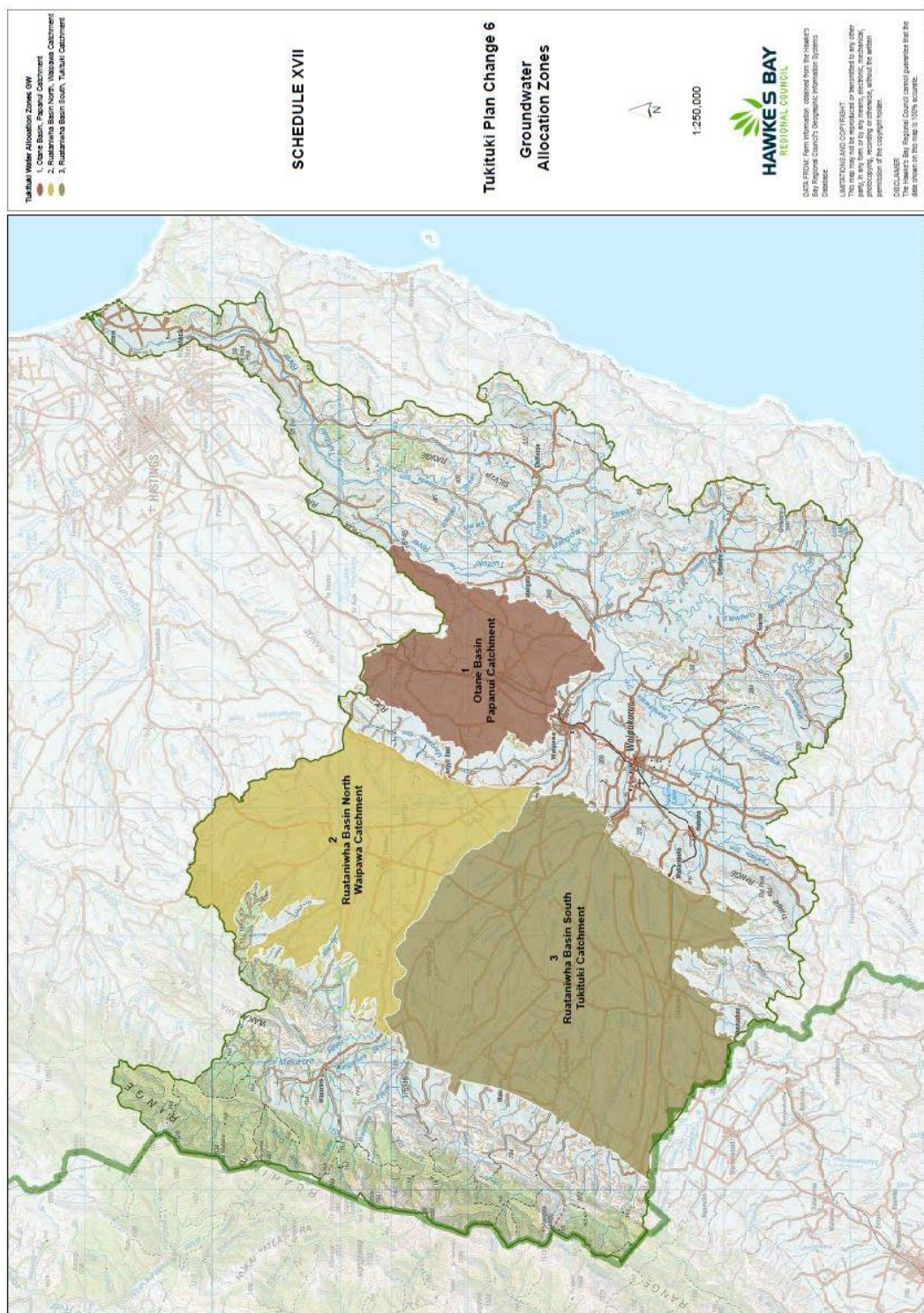


Figure 5: Groundwater Allocation Zones.

[154] Under Policy TT7 abstractions are either restricted or required to cease once the minimum flow levels shown in the relevant tables are reached. To allow time for farmers to adjust to the reduced security of supply of irrigation water, the minimum flow regime is phased in over 5 and 10 year periods.

[155] Policy TT8 explains how surface and groundwater allocation limits have been determined. This policy includes a statement that surface and groundwater allocation limits are based on the existing volume of consented abstractions.

[156] Steps that will be taken to implement these minimum flows and allocation limits are described in Policy TT9. These include the introduction of seasonal limits and a 'sinking lid' approach to the allocation of water for irrigation purposes. These policies attracted heavy opposition, particularly from existing extractors who faced a cut-back on the water that they would be able to extract.

[157] Before the hearing began HBRC made three significant concessions. First, it decided to revisit the approach to seasonal volumes in Schedule XVIII. Secondly, it abandoned the 'sinking lid' approach to surface water and groundwater takes. Thirdly, it added provision in Policy TT9 for the taking of water for the purpose of avoiding the death of horticultural or viticultural root stock or crops. While these concessions did not satisfy all submitters who were concerned about Policy TT9, they represented a step forward.

[158] Policy TT10 provides for the taking of water when rivers are running high, Policy TT11 relates to the interconnection between surface and groundwater, Policy TT12 to the transfer of consents, Policy TT13 to community irrigation schemes, Policy TT14 to the categorisation of consents and their duration, and Policy TT15 to recording and reporting requirements. The maximum duration of consents (5 years) attracted many submissions. During the inquiry process HBRC conceded that a maximum term of 20 years would be more appropriate and this satisfied most, if not all, of the submitters.

[159] By the time the hearing concluded minimum flows and water allocation limits remained the principal issues in contention with reference to water quantity. In the case of minimum flows there are significant disputes about the environmental issues to be protected, how this should be achieved, and the effect on the farming sector. Similar issues arise in relation to the allocation of water for irrigation purposes. These matters will be addressed shortly.

The Rules

[160] Again it is convenient to adopt the summary contained in HBRC's s 32 Evaluation Report :⁵⁹

“Rule TT1

Rule TT1 is a RMA section 9 permitted activity rule applying to all production land in the Tukituki River catchment. It is designed to implement the water quality policy direction discussed above.

Condition (a) implements the Policy TT4(1)(e) and (f) nitrogen leaching benchmarks and enables minor land use intensification to occur.

Condition (b) requires the records necessary for doing nutrient budgets to be kept (Policy TT4(1)(a)).

Condition (c) requires nutrient budgets to be prepared as discussed in Policies TT4(1)(c).

Condition (d) implements the industry good practice leaching rates and nitrogen conversion efficiencies discussed in Policies TT4(1)(b) and TT4(1)(c),

Condition (e) requires the phosphorus management plans to be prepared for the priority phosphorus management sub-catchments, as set out in policy TT5(1)(d)(iv).

Conditions (f) to (j) deal with stock exclusion from water bodies. Transition times are adopted that allow farmers a reasonable amount of time to implement the stock exclusion measures.

Conditions (k) and (l) deal with the avoidance of “hotspots” where the nitrate-nitrogen toxicity limits are breached and the avoidance of breaching the Resource Management (National Environmental Standards for Human Drinking Water) Regulations 2007 respectively.

⁵⁹ H Codlin and R van Voorthuysen, Section 32 Evaluation Summary Report for proposed Plan Change 6 Tukituki River Catchment, adopted by council on 24 April 2013, Folder 1 of Plan Change application documents, Tab 3, Page 91.

Rule TT2

Rule TT2 is the restricted discretionary activity default rule for land use that cannot comply with Rule TT1. The matters of discretion are designed to address any relevant matters that cause a land use activity to not comply with Rule TT1, together with consent duration and the review of consent conditions.

Rule TT3

Rule TT3 is a permitted activity rule that relates to the filling of agrichemical spray tanks, consistent with Policy TT9(1)(f)(iv).

Rule TT4

Rule TT4 is the discretionary activity rule for surface and groundwater takes in the Tukituki River catchment. Its conditions, standard and terms specify the take activities that are covered by the Rule, in order to give effect to the water quantity policies discussed above.

Rule TT5

Rule TT5 is the non-complying activity rule for takes other than those provided for under Rule TT4. Rule TT5 gives effect to Policy TT14(1)(e), amongst others.”

During the inquiry process a further rule (Rule TT6) was added.

[161] Under the new Rule TT6 the taking and use of surface or groundwater in contravention of allocation limits is a prohibited activity.⁶⁰ That Rule is in contention as is the status of some of the activities covered by other rules.

[162] The Board has considered the PC6 objectives, policies and rules presented by HBRC, and its decisions with respect to PC6 will be explained below.

Principal issues

[163] As already mentioned,⁶¹ the Board’s report must include a statement of the principal issues that were in contention and its main findings on those issues. The principal issues that were in contention are:

- consultation;

⁶⁰ This arose from the EDS submission seeking a prohibited activity status for any activity that did not comply with limits.

⁶¹ See Part 1, paragraph [54].

- objectives of PC 6;
- water quality;
- water quantity;
- cultural matters;
- terrestrial and freshwater ecology;
- amenity, recreational and social values;
- public health; and
- economics.

While each of these matters will be considered separately, there is a degree of overlap between many.

The Board's approach when resolving the principal issues

[164] Several aspects of the Board's approach need to be explained.

[165] First, as already mentioned, PC6 as notified was modified during the inquiry process. Unless otherwise stated there is no need to go into these modifications. Our starting point is the updated version of PC6 that was presented by HBRC at the end of the hearing (exhibit 90). That version dated 19 January 2014 is included as Appendix 4 of Volume 2 of this report.

[166] Secondly, the Board is obliged to apply s 32 of the RMA which relevantly provides⁶²:

⁶² Amendments to this section which came into force on 3 December 2013 do not apply.

“32 Consideration of alternatives, benefits and costs

....

- (2) A further evaluation must also be made by –
 - (a) a local authority before making a decision under clause 10 ... of Schedule 1 ...
- (3) An evaluation must examine –
 - (a) the extent to which each objective is the most appropriate way to achieve the purpose of this Act; and
 - (b) whether, having regard to their efficiency and effectiveness, the policies, rules, or other methods are the most appropriate way for achieving the objectives.
- ...
- (4) For the purposes of the examinations referred to in subsections (3) ..., an evaluation must take into account –
 - (a) the benefits and costs of policies, rules, or other methods; and
 - (b) the risk of acting or not acting if there is uncertain or insufficient information about the subject matter of the policies, rules, or other methods.
- ...”

Clause 10 of Schedule 1 (which is referred to in subsection (2) above) requires the Board to give a decision on matters raised in the submissions (but without having to give a decision that addresses each submission individually).

[167] Before arriving at findings on each principal issue the Board has examined and taken into account the matters referred to in s32 (3) and (4). Specific decisions on matters raised in the submissions are recorded in Appendix 3 of Volume 2 of this report.

[168] Thirdly, when deciding whether any amendments to PC6⁶³ are ‘within scope’ the Board has followed the approach explained by the High Court in *Countdown Properties (Northlands) Limited v Dunedin City Council*.⁶⁴

⁶³ Or were made during the inquiry process.

⁶⁴ *Countdown Properties (Northlands) Limited v Dunedin City Council*, [1994] NZRMA 145, at 166.

“The [Board] must consider whether any amendment ... to the plan change as notified goes beyond what is reasonably and fairly raised in submissions on the plan change ... It will usually be a question of degree to be guided by the terms of proposed plan change and the content of the submissions.”

Later the Court explained that whether any amendment was reasonably and fairly raised in a submission “should be approached in a realistic and workable fashion rather than from the perspective of legal nicety” as stated in *Royal Forest and Bird Protection Society v Southland District Council*.⁶⁵

[169] Fourthly, while the Board has taken into account the relevant statutory instruments and Part 2 of the RMA when arriving at its findings on each issue, it has in some cases left a more detailed discussion about those instruments and Part 2 of the RMA until the analysis of the principal issues had been completed. This avoids unnecessary duplication.

[170] Fifthly, the NPSFM requires the Board to have regard to the reasonably foreseeable impacts of climate change when considering both water quality and water quantity. Dr James Renwick, Associate Professor of Physical Geography at Victoria University told the Board that temperature increases in Hawke’s Bay of between 2 degrees and 3 degrees centigrade are likely by 2100. Rainfall is likely to decrease in winter and spring and increase slightly in summer and autumn. The risk of heat waves and drought conditions is likely to increase significantly while the risk of frosts and cold nights is likely to decrease. While a doubling or tripling of the drought risk is likely by the end of the century, the risk of heavy rainfall events is also likely to increase, although it is likely that this will not become evident in Hawke’s Bay until the late 21st century.⁶⁶ The Board has taken these matters into account when considering water quality and quantity.

[171] Finally, the Board received numerous representations and evidence on most of the principal issues. However, because they are so numerous we have not attempted to report on each of them. Nevertheless, in arriving at its findings the Board has considered and taken into account all the material before it, both written and oral.

⁶⁵ *Royal Forest and Bird Protection Society v Southland District Council*, [1997] NZRMA 408, at 413.

⁶⁶ J Renwick, Evidence in Chief, paragraph 2.2.

Issue one — consultation

[172] Consultation was a prominent issue throughout the hearing. Many submitters alleged that HBRC failed to fulfil its statutory obligation to consult during the preparation of PC6. Because different considerations apply to consultation with Māori on the one hand, and consultation with the community generally on the other, the Board will consider those matters separately. However, before addressing those matters it is helpful to provide some background.

[173] A schedule⁶⁷ of consultation undertaken which was attached to HBRC's s 32 Evaluation Report is reproduced below:

Date	Content
30 November & 1 December 2010	<p>Hawke's Bay Regional Water Symposium:</p> <p>Held in Napier and included over 100 participants represented 42 organisations and a broad range of interests and perspectives. The purpose of the Symposium was to develop a new regional strategy to respond to current and emerging water issues. Participants discussed their key values for each of the seven catchment zones in the Hawke's Bay, including the Tukituki River catchment and recorded these values on catchments maps. An outcome of the Symposium was the establishment of a Water Reference Group.</p>
28 February 2011	<p>First Water Strategy Reference Group meeting:</p> <p>Group discussed its vision, guiding principles and Terms of Reference. Also discussed catchment values derived from the Regional Water Symposium to determine whether the values were correct, whether all values had been captured, and whether there were any conflicts. In terms of the Tukituki River catchment the following was noted: urgent need to remedy deteriorating water quality, issue of nutrient loading if more land irrigated, and the significance of the Tukituki River for recreation purposes. Discussion on catchment variations and need for targeted management regimes (i.e. some catchments have quantity issues (e.g. Ruataniwha and Heretaunga) and other do not (e.g. Wairoa and Mohaka)). Working themes for Water Strategy objectives proposed.</p>

⁶⁷H Codlin and R van Voorthuysen, Section 32 Evaluation Summary Report Appendix 4 'Consultation undertaken', page 76.

21 March 2011	<p>Second Water Strategy Reference Group meeting:</p> <p>Received presentations from students of Napier Girls High School and Hukarere Girls College on their concerns around water in Hawke's Bay. Discussed draft evaluation criteria and preferred visions statements for the Water Strategy and a Draft Water Strategy Framework. Group discussion on possible actions for regional water governance, and water allocation, demand and supply.</p>
11 April 2011	<p>Third Water Strategy Reference Group meeting:</p> <p>Proposed Water Use Strategic Framework introduced. Presentations from Regional Council staff on the key scientific elements relevant to the proposed Strategic Framework. Presentations were given on: surface water allocation and ecological flows, groundwater, and the Hawke's Bay regional water resource.</p>
1 June 2011	<p>Fourth Water Strategy Reference Group meeting:</p> <p>Considered various water allocation options for the Tukituki River catchment based on security of supply and setting minimum flows to protect habitat and other values.</p>
31 August 2011	<p>Fifth Water Strategy Reference Group meeting:</p> <p>Considered first draft of the Land and Water Management Strategy</p>
11 October 2011	<p>Sixth Water Strategy Reference Group meeting:</p> <p>Considered the final draft of the Land and Water Management Strategy</p>
17 August 2011	<p>Lower Tukituki Hapū hui:</p> <p>Presentation given on the Tukituki plan change, including outline of reasons why a plan change was required and the likely outcomes. Meeting attendees were asked for comments about the best process to engage with the Lower Tukituki Hapū in relation to the plan change.</p>
23 August 2011	<p>Te Taiwhenua o Tamatea meeting:</p> <p>Presentation given on the Tukituki plan change, including outline of reasons why a plan change was required and the likely outcomes. Meeting attendees were asked for comments about Māori values associated with the Tukituki River catchment and the best process to engage with Tamatea in relation to the plan change.</p>

30 November 2011	<p>2nd Hawke's Bay Regional Water Symposium:</p> <p>The purpose of the Symposium was to present the Hawke's Bay Land and Water Management Strategy and to present a case study based on the Tukituki Catchment</p>
10 February	<p>Tukituki Stakeholder Group</p> <p>Presentation of values, and draft water allocation options</p>
9 March 2012	<p>Wider Regional/national Stakeholder Group</p> <p>Presentation of strategic context, catchment characterisation, values, water quantity and quality information.</p> <p>Council decided to review the approach being taken with regard to the Tukituki Plan Change and the Ruataniwha Water Storage Project. No further meeting were held of these two groups.</p>
April to August	<p>Land Use Intensification Working Group</p> <p>This is a sub-group of the Ruataniwha Water Storage Stakeholder Group. To support their work on examining the mitigation measures that might be required as part of the Ruataniwha Water Storage Project, this group sought information on nutrient management approaches that might be considered in the Tukituki plan change. A number of meetings were attended by planning staff. Discussion also included possible scenarios for The Tukituki Choices discussion document.</p>
September 2012	<p>Tukituki Choices consultation</p> <p>Special edition of HBRC newsletter Our Place delivered to all households in Hawke's Bay</p> <p>Three public meetings held</p> <p>Two breakfast meetings held</p>

Figure 6: Consultation Undertaken

Although these documents are included in the s 32 Evaluation Report concerning PC6, it can be inferred that they in general relate to the entire Tukituki Catchment Proposal (PC6 and RWSS).

[174] During the hearing the Board asked HBRC to provide a summary of the consultation that had been undertaken with specific reference to tāngata whenua. In response we were given a spreadsheet (exhibit 25). Dr Adele Whyte, Chief Executive Officer of NKII, took issue with parts of that spreadsheet and exhibit 80 summarises those matters.

[175] Beyond that the Board was provided with further documentation relating to consultation which is largely in the form of minutes of various meetings. These were received as exhibits and can be found at present on the EPA website⁶⁸.

[176] Further reference will be made to these various documents as the need arises.

Consultation with Māori

[177] The Board begins by addressing a preliminary issue that arose towards the end of the hearing.

[178] In relation to PC6 consultation with Māori was obligatory by virtue of clause 3(1)(d), Schedule 1, of the RMA.⁶⁹ During the course of the hearing an issue arose about whether the Board had jurisdiction to consider and determine the adequacy or otherwise of HBRC's consultation with tāngata whenua. This issue arose because counsel for NKII and Heretaunga alleged that the failure to consult on the plan change was 'a fatal flaw' which meant that PC6 could not be approved.

[179] In response counsel for HBRC claimed that the Board could not adjudicate on the alleged failure to comply with the requirements of the schedule. Only the High Court had the necessary jurisdiction and NKII and Heretaunga should have applied to that Court for judicial review. In support of that proposition Mr Robinson relied on various authorities including *Waikato Tainui Te Kauhanganui Inc v Hamilton City Council*.⁷⁰

[180] The Board is in a difficult position. By virtue of s 149Q(2) it is required to include in its draft report (and in the final report) a statement of the principal issues that were in contention and the main findings on those issues. The adequacy of consultation was very much at issue. If the Board is to comply with those statutory obligations it will obviously have to consider whether the complaints by NKII and Heretaunga are made out.

⁶⁸ Documents presented at the hearing can be found on the Board's website <http://www.epa.govt.nz/Resource-management/Tukituki/Hearing/hearing-proceedings/Pages/Hearing%20transcript%20and%20proceedings.aspx>

⁶⁹ This provision is quoted at paragraph [197].

⁷⁰ *Waikato Tainui Te Kauhanganui Inc v Hamilton City Council*, HC Hamilton, CIV 2009-419-1712, 30 June 2010, Allan J.

[181] As it turns out the Board has concluded that consultation with Māori met the statutory requirements. Under those circumstances the Board does not have to decide what would have happened if it had reached the converse view. Having said that, we think that it is highly likely that the position taken by counsel for HBRC about the limitation on our jurisdiction may be right.

Issues to be addressed

[182] As the Board sees it, the issues that arise from the submissions are whether the relevant Māori authorities were consulted about PC6, whether the authorities that were consulted were representative of the iwi and hapū that are affected by PC6, and whether the consultation was appropriate in all the circumstances.

The cases that were presented

[183] One of the grounds on which NKII and Heretaunga oppose PC6 is that consultation by HBRC was inadequate. To provide some context the Board will briefly outline the structure of the relevant authorities.

[184] Ngāti Kahungunu is the iwi of the Tukituki rohe. The iwi are represented by Ngāti Kahungunu Iwi Inc. Its Board includes representatives from the local taiwhenua who are themselves representative of the hapū and marae in their smaller rohe. The relevant taiwhenua boundaries were established by order of Māori Land Court.

[185] Two taiwhenua are directly affected by PC6:

- *Te Taiwhenua o Tamatea (referred to hereto and prior in this decision as Tamatea)*: representative for the purposes of this inquiry of the marae and hapū resident on the lands of the upper Tukituki catchment;
- *Te Taiwhenua o Heretaunga (referred to hereto and prior in this decision as Heretaunga)*: representative for the purposes of this inquiry of the marae and hapū resident on the lower lands beside the Tukituki River and the coast.

Whether one or either of Tamatea or Heretaunga is the appropriate iwi authority in relation to the Tukituki catchment was discussed at length. While Tamatea supports PC6, it is opposed by Heretaunga.

[186] At the heart of the argument for NKII is the proposition that HBRC failed to consult as required by clause 3(1)(d) of the First Schedule of the RMA which required HBRC to consult the tāngata whenua ‘through iwi authorities’. As NKII sees the matter, *it* was the sole iwi authority with jurisdiction over the area in question and accordingly the consultation should have been ‘through it’.⁷¹

[187] When giving evidence for NKII Dr Whyte explained the iwi’s concerns about the approach that had been adopted by HBRC:

“I think in this particular case, and for this particular proposal, it has implications iwi wide and for that reason, the iwi authority is the appropriate entity that this should actually have come to... What we want is full and transparent consultations with the right people and what Ngati Kahungunu Iwi Incorporated is – well, it is quite clear from our evidence – that we don’t believe that this has occurred, and one of the reasons that this may have occurred is because authorities have made a decision rightly or wrongly to consult with this group or that group and not actually got the full picture. Ngati Kahungunu Iwi Incorporated as the iwi, has the overview. We know which groups need to be consulted with and so we should be the first point of call.”⁷²

In other words NKII was concerned that HBRC had effectively adopted what could be described as a ‘bottom up’ approach when, as NKII sees it, NKII should have been the first port of call.⁷³

[188] While Dr Whyte acknowledged that she had participated on the Mana Whenua Working Group (MWWG) which was established by HBRC in late 2012, she did not regard her engagement with that group as consultation with the tāngata whenua through the iwi authority. She said that it had been stated at several meetings that working with the MWWG did not substitute for wider consultation.⁷⁴

⁷¹ A Whyte and N Tomoana, Joint Evidence in chief, paragraph 29.

⁷² A Whyte, Tukituki Catchment Proposal Hearing Transcript, page 3278.

⁷³ A Whyte, Tukituki Catchment Proposal Hearing Transcript, page 3278.

⁷⁴ A Whyte, Concise summary, paragraph 21.

[189] Dr Whyte also said that on a number of occasions between November 2012 and April 2013 she had raised that marae and hapū needed to be engaged on the Tukituki Catchment Proposal and that the findings and recommendations of the MWWG needed to be presented to marae and hapū within the catchment. This did not occur.⁷⁵ Although the MWWG completed a final report she did not sign it because, while it adequately represented the work of the MWWG, she was not convinced that the group had fulfilled the terms of reference that had been agreed in November 2012. In particular she remained unconvinced that the cultural and environmental parameters as identified in the ‘Tukituki River Catchment Cultural Values and Uses’ Report had been satisfactorily met.⁷⁶

[190] Now we turn to the case for Heretaunga. The primary witness for Heretaunga was Marei Apatu, its then interim acting Chief Executive Officer. He said that since 1989 HBRC had always engaged with the mana whenua of Ngāti Kahungunu through the HBRC permanent Māori Advisory Committee (MAC). However, during the development of the Tukituki Catchment Proposal HBRC changed its method of engagement and established the MWWG in November 2011.⁷⁷

[191] Mr Apatu said that Heretaunga was confused when HBRC appointed Dr Benita Wakefield to lead the research team to work on a cultural impact report. He considered that this appointment reflected a lack of engagement on the part of all marae and hapū that straddled the Tukituki awa. As the nominated representative for Heretaunga on the MAC he was disappointed that without input from the MAC or Heretaunga, HBRC had determined that Heretaunga did not have a mana whenua relationship with the catchment.⁷⁸

[192] Although he was invited to participate on the MWWG, Mr Apatu declined and Peter Paku became the Heretaunga representative instead. Mr Apatu also said that he felt that it was necessary to have a representative on that group from the iwi authority NKII, to ensure that the over-arching considerations of all the marae and hapū within

⁷⁵ A Whyte and N Tomoana, Joint Evidence in Chief, paragraph 67.

⁷⁶ A Whyte and N Tomoana, Joint Evidence in Chief, paragraph 69.

⁷⁷ M Apatu, Evidence in Chief, paragraph 29.

⁷⁸ M Apatu, Evidence in Chief, paragraphs 34–42.

NKII were adequately represented. His evidence was that Dr Whyte was nominated “as the Ngāti Kahungunu representative”.⁷⁹

[193] We now turn to the case for HBRC. As explained by Mr Robinson during opening submissions, it is HBRC’s case that the Council:

“...undertook a comprehensive consultation exercise involving detailed cultural assessment followed by the formation of the Mana Whenua Working Group described in the evidence of Mr Daysh. It is evident from the evidence which has been filed that this process did not successfully resolve all issues among all interested Māori stakeholders. It is submitted, however, that criticisms of process are unfounded.”⁸⁰

HBRC claims that the consultation groups it established included Ngāti Kahungunu representatives and that the engagement through Tamatea and Heretaunga was effective in ensuring that the values and views of tāngata whenua were known and taken into account when PC6 was developed.

[194] With reference to the adequacy or otherwise of consultation with Heretaunga Ms Codlin told the Board:

“HBRC engaged both Te Taiwhenua O Tamatea and Te Taiwhenua O Heretaunga to jointly prepare a cultural values and uses report for the Tukituki River. The researchers held numerous hui with marae and hapu involving them directly in the development of the report. Te Runanganui O Heretaunga, Nga Marae O Heretaunga, Te Taiwhenua Tamatea and Ngati Kahungunu Iwi Incorporated all made submissions on the Tukituki choices document. Council staff met with their representatives to discuss both plan change 6 and the RWSS.”⁸¹

Supporting this view Dr Wakefield said that in her opinion HBRC had consulted with mana whenua in the development of policies to consider cultural values relating to water flow and water quality in PC6.⁸²

[195] Finally, Tamatea’s position is summed up by the following passage from their counsel Ian Gordon’s opening submissions:

⁷⁹ M Apatu, Evidence in Chief, paragraphs 71–72.

⁸⁰ HBRC and HBRIC Opening Submissions, paragraph 183.

⁸¹ H Codlin, Tukituki Catchment Proposal Hearing Transcript, page 96.

⁸² B Wakefield, Evidence in Chief, paragraph 9.1.

“Tamatea do not accept the position put in the NKII submission and the joint evidence of Dr Whyte and Mr Tomoana that NKII is “mandated” to represent the Taiwhenua or has any “authority” over it with respect to RMA matters. If Te Taiwhenua o Heretaunga consider themselves to be a subsidiary of NKII, then that is entirely for them.”⁸³

With reference to clause 3(1)(d) of the First Schedule, Mr Gordon contended that the key words in that provision are “the tāngata whenua of the area who may be so affected” and that the words “through iwi authorities” go only to indicate how the tāngata whenua might be identified and contacted. He described the iwi authority as “the conduit”.⁸⁴

The Board’s and findings

[196] Part 1 of the First Schedule to the RMA relates to the preparation and change of policy statements and plans by local authorities, which of course includes HBRC. Clause 3 provides:

3. Consultation

- (1) During the preparation of a proposed policy statement or plan, the local authority concerned shall consult:
 - (a) the Minister for the Environment; and
 - (b) those other Ministers of the Crown who may be affected by the policy statement or plan; and
 - (c) local authorities who may be so affected; and
 - (d) *the tangata whenua of the area who may be so affected, through iwi authorities;*⁸⁵
- (2) A local authority may consult anyone else during the preparation of a proposed policy statement or plan.
- ...
- (4) In consulting persons for the purposes of subclause (2), a local authority must undertake the consultation in accordance with section 82 of the Local Government Act 2002.

⁸³ I Gordon, Te Taiwhenua o Tamatea Opening Submissions, paragraph 26.

⁸⁴ I Gordon, Te Taiwhenua o Tamatea Opening Submissions, paragraph 29.

⁸⁵ The italics have been added to highlight the critical words.

Under s 2 of the RMA ‘iwi authority’ means the authority which represents an iwi and which is recognised by that iwi as having authority to do so.

[197] In 2005 the following additional clause was inserted into the Schedule:

3B Consultation with iwi authorities

For the purposes of clause 3(1)(d), a local authority is to be treated as having consulted with iwi authorities in relation to those whose details are entered in the record kept under section 35A, if the local authority –

- (a) considers ways in which it may foster the development of their capacity to respond to an invitation to consult; and
- (b) establishes and maintains processes to provide opportunities for those iwi authorities to consult it; and
- (c) consults with those iwi authorities; and
- (d) enables those iwi authorities to identify resource management issues of concern to them; and
- (e) indicates how those issues have been or are to be addressed.

Reference to s 35A at the beginning of this clause leads us to that section which was enacted at the same time.

[198] Section 35A relevantly provides:

35A Duty to keep records about iwi and hapu

- (1) For the purposes of this Act or regulations under this Act, a local authority must keep and maintain, for each iwi and hapu within its region or district, a record of—
 - (a) the contact details of each iwi authority within the region or district and any groups within the region or district that represent hapu for the purposes of this Act or regulations under this Act; and
 - (b) the planning documents that are recognised by each iwi authority and lodged with the local authority; and
 - (c) any area of the region or district over which 1 or more iwi or hapu exercise kaitiakitanga.
- (2) For the purposes of subsection (1)(a) and (c),—
 - (a) the Crown must provide to each local authority information on—

- (i) the iwi authorities within the region or district of that local authority and the areas over which 1 or more iwi exercise kaitiakitanga within that region or district; and
 - (ii) any groups that represent hapu for the purposes of this Act or regulations under this Act within the region or district of that local authority and the areas over which 1 or more hapu exercise kaitiakitanga within that region or district; and
 - (iii) the matters provided for in subparagraphs (i) and (ii) that the local authority has advised to the Crown; and
- (b) the local authority must include in its records all the information provided to it by the Crown under paragraph (a).
- (3) In addition to any information provided by a local authority under subsection (2)(a)(iii), the local authority may also keep a record of information relevant to its region or district, as the case may be,—
 - (a) on iwi, obtained directly from the relevant iwi authority; and
 - (b) on hapu, obtained directly from the relevant group representing the hapu for the purposes of this Act or regulations under this Act.

...

Subsection (4) provides that the requirement under (1) to keep and maintain records does not apply to a hapū unless the hapū requests the Crown or relevant local authority to include the required information for that hapū.

[199] That summarises the statutory context within which the issue of consultation needs to be considered.

[200] As a result of correspondence between NKII and Te Puni Kōkiri the following information was entered on a website as an authoritative directory of iwi and Māori organisations.⁸⁶

“Ngati Kahungunu Iwi Inc represents Ngati Kahungunu as an iwi authority for the purposes of the Resource Management Act 1991.

Note, however, that resource issues at a local level are handled directly by the relevant Ngati Kahungunu Taiwhenua. See www.kahungunu.iwi.nz for contact details of the six Taiwhenua.”

⁸⁶ Exhibit 81: Letter to Gavin Ide HBRIC, OIA.

Although it was brought to the Board's attention that this entry was altered in November 2013, it is the above entry (which existed during the consultation) that the Board needs to take into account.

[201] Given that entry the Board does not think there can be any doubt that NKII was the relevant iwi authority for the purposes of the RMA. That said, it seems to the Board the second part of the entry created an ambiguity which left the entry open to the interpretation that NKII wanted resource issues at a local level to be handled directly by the relevant taiwhenua. This ambiguity might have been accentuated by NKII's submission in response to the Tukituki Choices document which said: "To effectively provide for the involvement of tāngata whenua, their values and interests in the management and decision-making of natural resources, their direct involvement is needed in the planning stages".⁸⁷

[202] Given that situation it is probably fair to say that any confusion about who was to be consulted was not entirely of HBRC's making. Nevertheless HBRC was under a statutory obligation to consult in accordance with clause 3(1)(d). In broad terms the Board agrees with Mr Gordon's interpretation of this clause. We consider that the focus is on consulting the tāngata whenua of the area who may be affected, and the word 'through' should be interpreted as meaning 'by means of'.

[203] The next issue is whether the consultation in this case accorded with the statutory requirements that we have just discussed. Tamatea accepts that it was properly consulted and we do not need to consider its involvement any further. The issue is whether NKII and Heretaunga were properly consulted.

[204] In terms of the general principles the leading case on consultation is *Wellington International Airport Ltd v Air New Zealand*⁸⁸ where the Court of Appeal approved the following explanation of McGechan J in the High Court:

"Consultation must be allowed sufficient time, and genuine effort must be made. It is to be a reality, not a charade. The concept is grasped most clearly by an approach in principle. To 'consult' is not merely to tell or present. Nor, at the other extreme, is it to agree. Consultation does not necessarily involve

⁸⁷ Exhibit 82 – Ngāti Kahungunu Iwi Incorporated Submission on Tukituki Choices.

⁸⁸ *Wellington International Airport Ltd v Air New Zealand*, [1993] 1 NZLR 671 at 675

negotiation toward an agreement, although the latter not uncommonly can follow, as the tendency in consultation is to seek at least consensus. Consultation is an intermediate situation involving meaningful discussion. Despite its somewhat impromptu nature, I cannot improve on the attempt at description which I made in *West Coast United Council v Prebble* at p 405:

Consulting involves the statement of a proposal not yet finally decided upon, listening to what others have to say, considering their responses and then deciding what will be done.”

McGechan J went on to say that a requirement that the party consulted will be adequately informed so as to be able to make intelligent and useful responses was implicit, as was the need to keep an open mind and be ready to change, or even start afresh.

[205] The issue of consultation in the context of clause 3 of the First Schedule of the RMA arose in *Waikato Tainui Te Kauhanganui Inc v Hamilton City Council*.⁸⁹ In that case it was alleged that the Council had breached its statutory obligation because it had not consulted before the plan under consideration was publicly notified. Allan J held that consultation had to take place before public notification. When arriving at that conclusion he noted that consultation is a two-way process to be conducted “in mutual good faith” and that its primary purpose was to enable decision-makers to make “informed decisions.”⁹⁰

[206] With the benefit of that background the Board now turns to the evidence and first considers whether the consultation with NKII was in conformity with statutory requirements as interpreted by the courts. For the following reasons the Board finds that it was.

[207] Consultation ‘through’ NKII effectively began with the Tukituki Choices discussion document which was released in September 2012. As the Board has already noted, this document was supported by numerous technical reports, and, following feedback, HBRC embarked on a strategy that ultimately led to PC6.

⁸⁹ *Waikato Tainui Te Kauhanganui Inc v Hamilton City Council*, HC Hamilton, CIV–2009–419–1712, 3 June 2010, Allan J.

⁹⁰ at [49] and [50].

[208] Under cross-examination Dr Whyte remembered the Tukituki Choices document coming out and that:

“....there was some level of engagement with NKII, but I don't think it was necessarily a formal process and it wasn't to the degree that we are used to in terms of plan changes.”⁹¹

Nevertheless it is important to keep this matter in perspective. First, the Tukituki Choices document was at a relatively early stage and much more interaction between HBRC and NKII was to follow. Secondly, NKII patently participated in the process by providing a written submission on 15 October 2012.⁹²

[209] In the meantime Ngahiwi Tomoana (Chairman of NKII) and Dr Whyte had attended a meeting with the Honourable Dr Pita Sharples. In exhibit 80 Dr Whyte describes this meeting as “a high level presentation” which could not be considered “consultation” or “engagement” with NKII. However, rather than viewing this meeting as an isolated event, the Board take it into account as part of an evolving process.

[210] In November 2012 Dr Whyte accepted an invitation to join the MWWG and thereafter attended the meetings of the group on a regular basis. Dr Whyte did not consider herself to be a NKII representative, but rather as a scientist in her own right.⁹³ This does not seem to be the way that Mr Apatu saw the matter. The Board also notes that Dr Whyte acknowledged that after meetings she reported back to her colleagues at NKII.⁹⁴

[211] The minutes of a meeting held on 17 December 2012 throw further light on whether Dr Whyte was attending the MWWG meetings as a representative of NKII or in her own right. It is recorded⁹⁵:

“...Peter [Paku] noted Adele's [Dr Whyte's] participation and her background stating that it was important that Ngati Kahungunu Iwi Incorporated (NKII) was included in this forum to enable collective feedback.”

⁹¹ A Whyte, Tukituki Catchment Proposal Hearing Transcript, page 3287.

⁹² Exhibit 82 – Ngāti Kahungunu Iwi Incorporated Submission on Tukituki Choices.

⁹³ A Whyte, Tukituki Catchment Proposal Hearing Transcript, page 3286.

⁹⁴ A Whyte, Tukituki Catchment Proposal Hearing Transcript, page 3293.

⁹⁵ Exhibit 83 – Approved Ruataniwha Water Storage Scheme Mana Whenua Working Party Meeting Minutes.

With reference to this passage Dr Whyte observed that they were not her words. Nevertheless the minutes containing those words were confirmed at the next meeting, Dr Whyte being present. If a false impression was created by the minutes there does not seem to have been any attempt to correct it.

[212] The Board finds that Dr Whyte attended the meetings of the MWWG primarily in her capacity as Chief Executive of NKII.

[213] At the next meeting on 24 January 2013 there was a ‘whiteboard’ session covering three issues that would have been of interest to NKII in the context of PC6: social and economic opportunities, environmental mitigation and monitoring, and cultural and accidental discovery protocols. It is apparent from the minutes that these matters were discussed and while under cross-examination Dr Whyte acknowledged that it was “fair to say that ... it was a round table discussion, so we were putting to the Board, you know, what we thought was important”.⁹⁶

[214] The minutes of the next meeting on 8 February 2013 record Dr Whyte’s involvement in discussions concerning a ‘Fish Hook’ summit and the information that needed to be presented at the summit. Dr Whyte was also involved discussion about native fish passage and Dr Whyte was involved in that discussion. Indeed, the minutes record that “Adele advised she felt there were some good ideas to come from the discussion and was interested to hear the ideas of others”.⁹⁷

[215] On 7 March 2013 the ‘Fish Hook’ summit was held. According to Dr Whyte’s summary in exhibit 80 this is an annual conference the iwi holds to cover a wide range of fishery and environmental issues. Approximately 150 people attended. Some information about the project was provided. While Dr Whyte did not consider this to be consultation or engagement with NKII, the Board views it as part of an ongoing process.

[216] A meeting was held on 18 March 2013 between Mr Tomoana, Andrew Newman (Chief Executive Officer of HBRC), and others. Judging from her comments in exhibit

⁹⁶ A Whyte, Tukituki Catchment Proposal Hearing Transcript, page 3297.

⁹⁷ Exhibit 83 – Approved Ruataniwha Water Storage Scheme Mana Whenua Working Party Meeting Minutes.

80 it appears that Dr Whyte was also present. She comments that the discussion focused on local government reforms and not on the RWSS. Nevertheless it was part of an ongoing process.

[217] Another meeting of the MWWG was held on 21 March 2013 during which Dr Whyte was critical of the RWSS Assessment of Environmental Effects Report. It needs to be remembered that at this stage both PC6 and the RWSS were being advanced together. A few days later there was a MWWG hui to talk about the RWSS.

[218] At a meeting on 4 April 2013 Dr Whyte informed the Group that the feedback to NKII was that there had not been enough public consultation. The minutes record that following discussion it was decided that Mr Daysh would talk with the HBRC Chief Executive about an extension. A technical report relating to the transport of nutrients in groundwater was also presented at the meeting.

[219] The same day NKII wrote to HBRC, with copies to Heretaunga and others, seeking a six month delay in the lodging of the RWSS application with EPA. That request was ultimately declined by HBRC.

[220] The only other meeting of the MWWG to which reference should be made took place on 17 April 2013. Dr Whyte was present. It is apparent that a significant amount of information was provided at this meeting. On 4 May 2013 PC6 was publicly notified. Although Dr Whyte attended further meetings of the MWWG after that time the ruling in *Waikato Tainui Te Kauhanganui* means that those meetings are irrelevant for present purposes.

[221] The Board is satisfied on the evidence that the consultation with NKII easily met the requirements of clause 3(1)(d) of the First Schedule. It is also satisfied that HBRC can be treated as having consulted with NKII by virtue of clause 3B of Schedule 1.

[222] Now the Board considers whether the consultation with Heretaunga satisfied the statutory requirements.

[223] On 1 August 2011 HBRC invited various marae on the lower Tukituki catchment to attend a hui at Heretaunga's premises. The letter carrying the invitation indicated that

HBRC wished to tell the invitees about “the wider fresh water management plan development for the Tukituki River Catchment, and discuss how we might best engage hapū in that process”.⁹⁸ Although the hui was held on 17 August 2011 it clashed with a tangi and the Māori King’s coronation, with the result that many people, including Mr Apatu, were unable to attend.

[224] Mr Apatu attended a second hui which was held on 30 August 2011. According to exhibit 25 there were various comments and concerns expressed at that hui including such things as whether fish passage was going to be looked at; whether groundwater and surface water would “be treated as one through the plan change process”⁹⁹; what Māori science would be incorporated; and concerns about whitebait at the mouth of the river.

[225] On 13 February 2012 Mr Apatu and others accompanied officers of HBRC on a visit to the proposed dam site.¹⁰⁰

[226] Mr Apatu was a member of the MAC. This committee included representatives from Heretaunga, Tamatea, two other taiwhenua, and HBRC. The Board finds that Mr Apatu was one of the Heretaunga representatives.

[227] The minutes of the MAC record¹⁰¹ that there was a ‘PowerPoint’ presentation on 28 February 2012 which outlined progress on the RWSS. It is also recorded in the minutes that a cultural impact assessment had been undertaken “with the help of Dr Wakefield and Mr Apatu”. A progress report was given on the plan change and Mr Apatu moved that the report be received.

[228] A further update on the progress of the Tukituki Catchment Proposal was provided to the MAC by the HBRC chief executive, Mr Newman, at a meeting on 26 June 2012. Mr Apatu was present. According to the minutes Mr Newman indicated that the first task of the regional planning committee would be to look at whether the

⁹⁸ Exhibit 77 — Letter from Hawke’s Bay Regional Council on Ruataniwha Water Storage Scheme Feasibility Study discussion meeting.

⁹⁹ Exhibit 25 — Mana Whenua Consultation Sschedule Sspreadsheet S Daysh.

¹⁰⁰ Exhibit 25 — Mana Whenua Consultation Schedule Sspreadsheet S Daysh.

¹⁰¹ Exhibit 74 — Māori Committee Meeting Minutes, 28 February 2012.

regional water strategy “that Ms Moffatt and Mr Apatu helped to produce” should be inserted into the regional water strategy. Ms Moffatt and Mr Apatu are recorded as having given a presentation of the ‘Lower Tukituki River Cultural Values and Uses’ Report on behalf of the Heretaunga hapū.¹⁰²

[229] The next relevant minute relates to the meeting on 28 August 2012. While Mr Apatu does not appear to have been present, the Board notes that a PowerPoint presentation was given on progress with the Tukituki Choices document. The assistance and support of Tamatea and Heretaunga in relation to cultural values was recorded. We also note that Heretaunga made a submission on the Tukituki Choices document (although that submission does not appear to be before the Board).

[230] At the meeting of the MAC on 30 October 2012 members of the committee were invited to make comment on the Tukituki Choices document. The minutes record that matters raised included guardianship roles, cultural values, mauri, and a cultural index tool to evaluate the health of the waterways. There was also a presentation by Dr Wakefield which amongst other things, outlined the Māori planning perspective. Mr Apatu also commented on the Heretaunga submission.

[231] After the MAC ceased to be involved in the Tukituki Catchment Proposal the MWWG was formed and seems to have taken over that role. The Board does not see anything sinister in this change, which might be explained on the basis that a greater distance between HBRC and the advisory body was required. In any event it appears from exhibit 78 that Mr Apatu was involved in the drafting of the terms of reference for the MWWG. Mr Paku and Des Ratima represented Heretaunga on the new body and regularly attended its meetings.

[232] The Board has already discussed the relevant MWWG meetings with reference to NKII and it is unnecessary to repeat what we have already said. Suffice to say that Heretaunga, through its representatives at those meetings, continued to take part in the consultation process.

¹⁰² Exhibit 74 — Māori Committee Meeting Minutes, 26 June 2012.

[233] Contrary to Heretaunga's submission, the Board is completely satisfied that over a relatively lengthy period Heretaunga was involved in a consultation process pursuant to clause 3(1)(d) of the First Schedule. We are also satisfied that this process involved the tāngata whenua of Heretaunga and that it was appropriate in all the circumstances.

[234] That completes the discussion about consultation with Māori. Now the Board turns to consultation with the community generally.

Consultation with the community

[235] Ms Codlin was the primary witness for HBRC in relation to the issue of consultation with the community generally. Her evidence was:

“A five week public consultation period over September and October 2012 was given for comments to be made on the choices, and this was extended by 10 days following some concern in the community about the perceived short time frame. A comprehensive presentation was given by senior HBRC staff at three public meetings and two breakfast meetings during that period.”¹⁰³

She noted that 164 organisations or individuals had responded, with their responses having been summarised in the s 32 Evaluation Report.¹⁰⁴

[236] Any suggestion that the scenarios presented in the Tukituki Choices document were biased, flawed or were simply propaganda, were rejected by Ms Codlin. She attributes those allegations to the strong feelings that are held within the community about the management of freshwater resources in Hawke's Bay.¹⁰⁵ In response to a question from the Board she confirmed that in her view the consultation had complied with legal requirements.

[237] Criticism of the consultation process was levelled by many submitters. Locals such as Craig Preston felt that other groups had been preferred in the process.¹⁰⁶ Terry Kelly, a former Massey University lecturer, felt that stakeholder groups were

¹⁰³ H Codlin, Evidence in Chief, paragraph 10.4.

¹⁰⁴ H Codlin, Evidence in Chief, paragraph 10.5.

¹⁰⁵ H Codlin, Evidence in Chief, paragraph 10.6.

¹⁰⁶ C Preston, Craig Preston Trust Representation, page 2, section 3.

“handpicked” and certain information was held back from the public.¹⁰⁷ The local Fish and Game representative, Peter McIntosh, felt that Fish and Game had engaged as well as it could, given that the process was a “moving feast”.¹⁰⁸

[238] Other submitters alleged that the Tukituki Choices document was biased. For example, Megan Rose said that this document was:

“... biased, inaccurate on key points, silent about key issues still under review and their significance, and therefore misleading.”¹⁰⁹

Speaking along similar lines Mr Kelly said that while the consultation might have been adequate to “tick the box”, it was blatantly manipulative and violated the spirit of good public consultation.¹¹⁰

[239] Some submitters felt so strongly about the Tukituki Choices document that they labelled it propaganda. For example, Paul Bailey said:

“HBRC produced what I describe as the propaganda document called “Tukituki Choices”. It was very selective in the use of language, water storage good, no water storage bad. It was a travesty in that it did not present the options to ratepayers in an honest manner nor did it present anything other than four narrow alternatives that were clearly designed to predetermine any feedback.”¹¹¹

Mr Bailey believed that the concerns of the wider community had not been taken seriously by HBRC.

[240] Even the attitude of HBRC when deciding that the Tukituki Catchment Proposal should be referred to a Board of Inquiry attracted comment. Chris Perley said:

“I was present at the Council when the CEO came back into the HBRC chambers and announced that the Tukituk proposal was being considered by a Board of Inquiry. He and a number of counsellors were very happy to hear that news. Their happiness concerned me then and it concerns me now because we’ve had enough of the marginalising processes that we’ve been facing and I know a number of people who’ve not bothered to appear before this Board

¹⁰⁷ T Kelly, Tukituki Catchment Proposal Hearing Transcript, page 3424.

¹⁰⁸ P McIntosh, Evidence in Chief, paragraph 72.

¹⁰⁹ M Rose, Tukituki Catchment Proposal Hearing Transcript, page 2884.

¹¹⁰ T Kelly Tukituki Catchment Proposal Hearing Transcript, page 3424.

¹¹¹ P Bailey, Tukituki Catchment Proposal Hearing Transcript, page 2969.

because they've actually lost faith and see any decision as a fait accompli to suit those who'll benefit the most."¹¹²

Mr Perley also found the suggestion that the proposal was being touted as a model for rolling out over the whole of the country made it doubly disturbing.

[241] Against that background the Board now addresses the legal position, which is well settled. While local authorities are obliged to consult tāngata whenua in relation to proposed plans, there is no corresponding requirement to consult with non tāngata whenua. However, if a local authority decides to consult with anyone else (as it is entitled to do by virtue of clause 3(2) of the First Schedule of the RMA), it is required by clause 3(4) of that Schedule to undertake that consultation in accordance with s 82 of the Local Government Act 2002.

[242] Section 82(1) of the Local Government Act 2002 sets out the following principles of consultation:

“82 Principles of consultation

- (1) Consultation that a local authority undertakes in relation to any decision or other matter must be undertaken, subject to subsections (3) to (5), in accordance with the following principles:
 - (a) that persons who will or may be affected by, or have an interest in, the decision or matter should be provided by the local authority with reasonable access to relevant information in a manner and format that is appropriate to the preferences and needs of those persons:
 - (b) that persons who will or may be affected by, or have an interest in, the decision or matter should be encouraged by the local authority to present their views to the local authority:
 - (c) that persons who are invited or encouraged to present their views to the local authority should be given clear information by the local authority concerning the purpose of the consultation and the scope of the decisions to be taken following the consideration of views presented:

¹¹².C Perley, Tukituki Catchment Proposal Hearing Transcript, page 2988.

- (d) that persons who wish to have their views on the decision or matter considered by the local authority should be provided by the local authority with a reasonable opportunity to present those views to the local authority in a manner and format that is appropriate to the preferences and needs of those persons:
- (e) that the views presented to the local authority should be received by the local authority with an open mind and should be given by the local authority, in making a decision, due consideration:
- (f) that persons who present views to the local authority should be provided by the local authority with information concerning both the relevant decisions and the reasons for those decisions.”

It is implicit in these principles that the affected community must have reasonable access to relevant information so that its citizens can make intelligent and useful responses. They must also be encouraged to present their views and be afforded a reasonable opportunity to do so. And when those views are presented the local authority must consider them with an open mind.

[243] Given the strongly held views about the Tukituki Catchment Proposal it is probably not surprising that the issue of consultation attracted so much attention, with many of the views being expressed in very forthright terms. The Board accepts that the views expressed by the submitters were sincere. Ultimately however, it is necessary for the Board to exercise an overall objective judgement as to whether the consultation met the requirements set by law.

[244] When undertaking that task the Board keeps in mind that as the Environment Court observed in *Wairoa District Council v Hawke's Bay Regional Council*¹¹³ consultation is not an end in itself. This emphasises that consultation about a proposed plan is part of an overall process. The ultimate shape of a plan is unlikely to satisfy everyone, as is illustrated by PC6.

¹¹³ *Wairoa District Council v Hawke's Bay Regional Council*, [2010] NZEnvC 420 at [16].

[245] Clearly the Tukituki Choices document of September 2012 was a very important component of the consultation process. It was an extensive discussion document running into 86 pages. Information in the document included such matters as the HBRC's vision for the catchment, issues arising, a brief history, the Council's objectives, possible choices, and technical information. There was also discussion about how the objectives might be achieved by reference to minimum flows, water allocation limits, quality limits and management of nutrient loads.

[246] Four choices (two with storage and two without) were included in the document. Environmental, economic, social and cultural benefits and costs were evaluated for each option. The stated aim of the document was to give information about the options so that members of the public could provide written submissions to help guide HBRC's decision making. Forty two technical reports from which information had been derived were listed.

[247] Feedback from the public was encouraged, and the period originally set for submissions to close was extended. Further public presentations were made by HBRC officials. A relatively large number of submissions were received and analysed.

[248] When assessing the adequacy or otherwise of the consultation with the community we also need to take into account events leading up to the Tukituki Choices document. In 2010 there had been a two day water symposium attended by a large number of people representing a wide cross-section of the community. A detailed report about that symposium was published. Following that there had been study group meetings. A second one day symposium, which was again well attended by a wide cross-section of the community, was held the following year. Again a detailed report was published. Further group meetings were held.

[249] While views differ about the contents of the Tukituki Choices document, the Board is satisfied that the approach adopted by HBRC met legal requirements. Over a lengthy period the community was provided with extensive information which enabled citizens to make intelligent and useful responses to the discussion document. The document itself encouraged responses and the Board accepts that the period allowed for submissions to be made was reasonable in all the circumstances. There is no sound basis

on which the Board could find that HBRC had failed to consider the submissions with an open mind.

[250] The Board therefore concludes that consultation with the public conformed with legal requirements.

Issue two — the objectives

[251] Before evaluating the objectives that remain in contention the Board records that, as required by s 32(3)(a) of the RMA, it has examined “the extent to which each objective is the most appropriate way to achieve the purpose of the RMA”. Further, where objectives were modified during the course of the hearing and are no longer in contention, the Board is satisfied that the objectives as modified, are the most appropriate way to achieve the purpose of the RMA.

[252] Now the Board turns to the objectives that remain in contention.

OBJ TT1 — Beds of rivers, lakes and wetlands

[253] For Fish and Game Ms Marr proposed the addition of the bracketed words in italics at the beginning of OBJ TT1:

To sustainably manage the use and development of land (*including the beds of rivers, lakes and wetlands*), the discharge of contaminants...

But she acknowledged that it was arguable that the beds of rivers and lakes were already incorporated into the objectives by virtue of the reference to ‘land use’ in several places.¹¹⁴

[254] The Board is satisfied that the proposed amendment is unnecessary. In the definition section of the RMA (s 2) the word “land” as defined includes land covered by water. Thus the additional words proposed by Ms Marr would be redundant.

¹¹⁴ H Marr, Evidence in Chief, paragraph 216.

Addition of a values objective

[255] Fish and Game seeks the inclusion of the following new objective at the beginning of the objectives listed in OBJ TT1:

- (aa) The values of freshwater identified in Schedule XIVA are recognised and provided for.

The wording of this additional objective comes from the evidence of Helen Marr. EDS supports inclusion of this objective, including the Schedule.

[256] A spreadsheet comprising Schedule XIVA was exhibited to the evidence of Kathryn McArthur, a water scientist who gave evidence for EDS. According to Ms McArthur the method used to determine the values of each of the 19 sub-catchments referred to in the schedule was sound and the significance levels had been appropriately identified.¹¹⁵

[257] Supporting inclusion of the new objective, Ms Marr contended that listing these values in PC6 would provide important contextual information that would help focus and inform resource management decisions. She noted that the Horizons Regional Council One Plan in Manawatu-Wanganui contains a similar schedule which has proved to be helpful for the processing of resource consents. Ms Marr also contended that inclusion of a list of values in PC6 would be of assistance if plan changes were contemplated in the future. Finally, she maintained that if values are to be “recognised and provided for” the listing of values would provide clear guidance as to how those values are to be managed.¹¹⁶

[258] HBRC and others oppose inclusion of the objective for several reasons: it is unnecessary because PC5 already contains a table listing values relating to the Tukituki catchment; if anyone wanted to explore values they would be able to go to the Council’s s 32 Evaluation Report relating to PC6 and the underlying technical reports; and in any event the list of values is incomplete and some of the ranking of values is contested.

¹¹⁵ K McArthur, Evidence in Chief, paragraph 38.

¹¹⁶ H Marr, Evidence in Chief, paragraphs 203–212.

[259] Several factors lead the Board to the conclusion that the new objective proposed by Fish and Game would not be the most appropriate way to achieve the purpose of the RMA.

[260] First, a list of primary and secondary values for the catchment are already listed in Table 1, Policy LW2, of PC5. As mentioned earlier, this is a proposed regional policy statement. Under cross-examination¹¹⁷ Ms Marr accepted that HBRC “has done a reasonably thorough job in identifying issues in PC5 within the catchment”. While there are still appeals pending in relation to PC5 it seems highly improbable that this table will disappear. The Board also notes that Policy LW2 requires management of the catchment in a manner that recognises and gives priority to maintaining or enhancing the primary values and uses identified in Table 1. As the Board sees it, the table of values proposed by Fish and Game and EDS would not sit comfortably with Table 1.

[261] Secondly, while the list of values proposed by Fish and Game and EDS is relatively extensive, it is nevertheless incomplete. As Mr van Voorthuysen¹¹⁸ and Sharon Dines¹¹⁹ (the planner for Fonterra and Dairy NZ) pointed out, the proposed list of values does not include the full range of human use values for the whole catchment. For example, unlike the table in PC5 it does not include the needs of drinking water for people and stock; for urban, commercial and industrial purposes; or for land-based primary production. Under cross-examination¹²⁰ Ms Marr acknowledged that the full range of use values has not been included in the table proposed by Fish and Game and EDS.

[262] Thirdly, the ranking of some of the values is contested. To take an example, the proposed list of values ranks some parts of the catchment as an outstanding trout fishery. However, Iain Maxwell, who leads the science team for HBRC, considers the fishery to be nationally significant, but not outstanding.¹²¹ Resolving the competing views and providing a comprehensive list of values that correlate with PC5 would not be easy.

¹¹⁷ H Marr, Tukituki Catchment Proposal Hearing Transcript, page 2703.

¹¹⁸ R van Voorthuysen, Rebuttal Evidence, paragraph 22.3.

¹¹⁹ S Dines, Rebuttal Evidence, paragraph 5.4

¹²⁰ H Marr, Tukituki Catchment Proposal Hearing Transcript, page 2704.

¹²¹ I Maxwell, Evidence in Chief, paragraphs 8.3 to 8.5.

[263] Finally, the Board notes that at the conference of planners on 21 October 2013 Ms Marr and Peter Reaburn (Planning consultant for EDS) were the only planners to support inclusion of the new objective. Even then the conferencing report records that while Mr Reaburn considered “such information to be helpful [he] does not consider it to be necessary”.¹²² So the majority of the planners were of the view that the values should not be included.

[264] The Board agrees with Mr van Voorthuysen and Ms Dines that if there is to be a departure from the values listed in PC5 it would be best achieved by a plan change in the future. This would provide interested and potentially affected parties with a greater opportunity to examine and comment on the issue than has been possible during this inquiry process.

OBJ TT1(a) — Physical characteristics

[265] Ms Marr seeks addition of the words shown in italics in paragraph (a) of OBJ TT1:

- (a) “Groundwater levels, river flows, lake and wetland levels and water quality *and physical characteristics* maintain or enhance the habitat and health of aquatic ecosystems...”

The Board understands that the underlying purpose of adding these words is to make it clear that the management of ecosystem health requires the management of *habitat* as well as water quantity and quality.

[266] This issue was also discussed by the planners at their conference on 21 October 2013. The conferencing report indicates that Mr van Voorthuysen considered the matter was adequately covered by Chapter 5.8 of the RRMP which deals with the beds of rivers and lakes. He also questioned whether the addition of the words sought was within scope. With the exception of Ms Marr the planners present did not support the inclusion of the additional words.

¹²² Expert Conferencing Joint Witness Statement to the Board of Inquiry — Planners (Change 6), 22 October 2013.

[267] The Board agrees that the additional words are unnecessary. To the extent that there might be a void in OBJ TT1(a) the Board is satisfied that the matter is adequately covered by Chapter 5.8 of the RRMP which includes a policy (POL79) specifically referring to habitat protection in the context of the beds of rivers and lakes.

Wording of OBJ TT1 (ba)

[268] Dr Nicholas Jones, Medical Officer of Health for the Hawke's Bay District Health Board, suggested that this objective be amended by the addition of the words in italics:

- (ba) Water quality *and quantity* enables safe and reliable human drinking water supplies.

The Board agrees and that the objective should be amended accordingly.

Wording of OBJ TT1(d)

[269] Ms Marr would like to see this objective re-worded so that it reads:

- (d) "Wetlands are protected, including their significant values."

The Board understands that Ms Marr wishes to ensure that *all* wetlands in the catchment will be protected. She considers this would better reflect s 6(b) of the RMA which lists the protection of wetlands (without qualification) as a matter of national importance.

[270] While the Board can understand the point Ms Marr is making, it considers it significant that one of the purposes of PC6, as stated in its preamble, is to implement the NPSFM. Two of the objectives in that Policy Statement (Objectives A2 and B4) relate specifically to wetlands. In each case the objective is to protect significant values, presumably on the basis that the protection of those values will ensure that the wetland will be protected to the desired extent.

[271] Thus OBJ TT1(d) gives effect to the NPSFM by adopting the very wording used in the Policy Statement. PC5 also contains an objective (OBJ LW1) which would require freshwater and land use and development to be managed in an integrated and sustainable manner which includes (amongst other things) "protecting the significant

values of wetlands”¹²³. Again, OBJ TT1 (d) expressly gives effect to that proposed objective which would form part of the Regional Policy Statement.

[272] When pressed by Mr Robinson about the implications of the wording she was seeking, Ms Marr explained that she was relying on the following definition of wetlands in PC5:

“**Wetland** includes permanently or intermittently wet areas, shallow water, and land water margins that support a natural ecosystem of plants and animals that are adapted to wet conditions. For the purposes of this Plan, a wetland is not:

- a) wet pasture or cropping land
- b) artificial wetlands used for wastewater or stormwater treatment
- c) farm dams and detention dams
- ca) reservoirs, dams and other areas specifically designed and established for the construction and/or operation of a hydro-electric power scheme.
- d) land drainage canals and drains
- e) reservoirs for fire fighting, domestic or municipal water supply
- f) temporary ponded rainfall
- g) artificial wetlands created for beautification purposes.”

Her point was that this is much narrower than the definition contained in the RMA.

[273] It is true that this is narrower than the RMA definition. Nevertheless it is still relatively wide and a requirement to protect *all* wetlands regardless of values could have significant cost consequences. The Board is satisfied that the current wording of OBJ TT1(d) achieves the purpose of the RMA because if *significant values* of a wetland are protected, then the wetland *itself* will be adequately protected.

Wording of OBJ TT1(f)

[274] Throughout the hearing there was considerable debate about this objective which relates to the taking and use of water for primary production and the processing of beverages, food and fibre.

¹²³ We have added the emphases.

[275] As originally notified PC6 did not include an objective of this nature. However, Horticulture NZ, the Ruataniwha Water Users Group (RWUG) and others sought inclusion of an objective that recognised the use of water for primary production etc. At the planners conference on 21 October 2013 all the planners, other than Ms Marr and Mr Reaburn, supported the following objective:

- (f) The taking and use of water for primary production and the processing of beverages, food and fibre is enabled.

During the hearing the debate revolved around three main issues: whether such an objective should be included; if so, whether it should be subservient to the environmental objectives; and its wording.

[276] The first consideration is whether objective (f) should be included as an objective. In broad terms those supporting inclusion do so on the basis that it would improve the overall balance of the objectives contained in OBJ TT1. Those opposing contend that inclusion of such an objective would be inconsistent with s 5 of the RMA which expresses 'wellbeing' as being subject to the 'while' matters. They also contend that the RRMP already covers the matter.

[277] While paragraph (f) is of a different nature to the other paragraphs within OBJ TT1, it needs to be kept in mind that the overall objective is "...to manage the use of water..." for stated purposes. The purpose described in (f) is obviously a legitimate purpose. The Board does not agree that inclusion of this purpose would be inconsistent with s 5 of the RMA. Further, OBJ LW2 (in PC5) requires the multiple and competing values and uses of land and water to be recognised and balanced. The Board considers that inclusion of *all* major competing values in OBJ TT1 gives effect to that provision.

[278] In the Board's view, therefore, the matters covered by paragraph (f) have a legitimate place in OBJ TT1. The next issue is whether those matters should be subservient to the environmental objectives.

[279] As Mr St Clair pointed out in his planning report, one of the implications of making (f) subservient to the environmental objectives is that it would not be possible to have a policy such as POL TT9 (1)(f)(iva) which enable takes to continue (for rootstock and crop protection after minimum flows had been reached. Mr St Clair also considered

that (f) should be included in OBJ TT1, “as part of the overall use and development of land” because it provides part of the ‘overall picture’ as to how the NPSFM is to be given effect to.¹²⁴

[280] In broad terms Mr van Voorthuysen supported that approach. Under cross-examination¹²⁵ he expressed the view that the matters contained in the various paragraphs of OBJ TT1 would need to be balanced “in the round in each case”.

[281] The Board considers these points are well made and that there is no justification for making (f) subservient to the environmental objectives. That leaves the question of how the objective should be worded. As originally drafted the objective used the word ‘enabled’. It is now an objective to be ‘provided for’. This amended wording received widespread support and the Board are satisfied that it is preferable to the initial wording.

OBJ TT4 — Existing takes support significant investment

[282] This objective was re-worded as a result of the first planners’ conference. But Ms Marr and Mr Reaburn did not agree with the concluding words “while recognising that existing takes support significant investment” because they considered it suggests that the minimum flow regime can be breached.

[283] The Board does not have any difficulty with this objective as it stands. There is ample evidence that the existing takes support existing investment. The Board also accepts that this is a legitimate consideration when managing the abstraction of surface water and the minimum flow regime. Rather than suggesting that the minimum flow regime can be breached, this objective recognises that there will be situations where some essential takes will need to be managed when minimum flows are reached, for example rootstock and crop protection.

OBJ TT5 — Storage and irrigation schemes

[284] As originally notified OBJ TT5 did not make reference to on-farm storage and confined community irrigation schemes to those capable of supplying water to at least

¹²⁴ Hill Young Cooper Planning Review of Amendments to Change 6, paragraphs 4.10 to 4.13.

¹²⁵ R van Voorthuysen, Tukituki Catchment Proposal Hearing Transcript, page 949.

5000ha. As a result of the inquiry process, on-farm storage was included and the 5000ha requirement was dropped.

[285] While Mr Reaburn, considered that OBJ TT5 was inappropriate and he would have preferred it to be dropped, he accepted that there was no submission seeking such an outcome that would empower the Board to delete the objective. This led Mr Reaburn to suggest a modification to the wording whereby the objective would be to *manage* rather than *develop* on-farm storage or irrigation schemes.

[286] The Board does not consider that this change is necessary. It is clear from the objective that on-farm storage or community irrigation schemes would have to meet the preceding objectives.

[287] NKII and Heretaunga sought to have TT5 amended so that it reads:

“...on-farm storage and community irrigation schemes that improve *the sustainable management* [~~and maximise the~~] efficient allocation and efficient use of water.”

The words in italics were to be added and the words in brackets deleted. The Board does not accept that repeating words from s 5 of the RMA adds anything. On-farm storage and community irrigation schemes would have to meet the sustainable management requirements of the RMA.

[288] Finally, EDS suggested that schemes should only be enabled where there is an over-allocation of water. Again, the Board does not consider that any change is needed because the necessary protection is already provided by the objective, the governing legislation, and any relevant instruments.

Issue three — water quality

[289] Management of water quality lies at the heart of PC6, and the approach adopted in the proposed plan attracted extensive debate. Although the submissions on this topic covered a wide spectrum, they fall into two broad categories.

[290] In the first category are the submitters supporting the approach adopted by HBRC towards nutrient management in PC6. This has been described as a ‘single nutrient’ approach focusing on the management of phosphorus, with a relatively ‘hands off’ approach to the management of nitrogen. Submitters in this category include Federated Farmers, Dairy NZ, the Hawke’s Bay branch of New Zealand Deer Farmers Association (HBDFA), Horticulture NZ and others, and the Fertiliser Association of New Zealand (FANZ).

[291] At the other end of the spectrum are submitters such as Fish and Game, Forest and Bird, EDS, and numerous lay submitters who seek water quality improvement within the catchment and a ‘dual nutrient’ approach which includes tight controls over *both* nitrogen and phosphorus. Supporting that approach are NKII and the Heretaunga parties who seek to have the mauri or ‘life force’ of water within the Tukituki catchment improved in a cultural sense and also in a practical sense in their role as Kaitiaki.

[292] Irrespective of where submitters sat on the spectrum, there was a measure of agreement that land use is critical to the management of water quality. Mr van Voorthuysen put the issue succinctly when he said, in response to a Horticulture NZ and others submission seeking specific provisions for the enhancement of primary production¹²⁶:

“... that is not the reason why water quality limits are set. Instead, to give effect to objective A1 and policy A1 of the NPSFM, water quality limits are set to safeguard aquatic ecosystems. Land use activities and primary production activities then need to be managed so that those limits are not exceeded.”

The Board agrees with that broad proposition. Management of nutrients in water is inextricably linked to the management of land use.

National Policy Statement for Fresh Water Management (NPSFM)

[293] As stated in Part 1 of this report, PC6 is the first of a number of catchment specific plan changes that seek to implement this National Policy Statement. The preamble to the Policy Statement explains:

¹²⁶ R van Voorthuysen, Evidence in Chief, paragraph 10.10.

“Setting enforceable quality and quantity limits is a key purpose of this National Policy Statement. This is a fundamental step to achieving environmental outcomes and creating the necessary incentives to use fresh water efficiently, while providing certainty for investment. Water quality and quantity limits must reflect local and national values. The process for setting limits should be informed by the best available information and scientific and socio-economic knowledge.”

It is also recorded in the preamble that the management of the water resource needs to reflect the catchment-level variation between water bodies. Hence the catchment by catchment approach utilised by HBRC.

[294] When the NPSFM came into effect its underlying concepts and principles were not altogether new. Many of the phrases used in the Policy Statement echo Part 2 of the RMA. Rather than existing in a vacuum, the NPSFM informs and is informed by, the Part 2 considerations of the RMA. The purpose of promoting sustainable management of natural and physical resources remains paramount and is not subsumed by imperatives of economic development on one hand or total prohibition from resource use on the other.

[295] The NPSFM contains two objectives relating to water quality:

“Objective A1

To safeguard the life supporting capacity, ecosystem processes and indigenous species including their associated ecosystems of fresh water, in sustainably managing the use and development of land, and the discharges of contaminants.

Objective A2

The overall quality of fresh water within a region is maintained or improved while:

- a) protecting the quality of outstanding fresh water bodies;
- b) protecting the significant values of wet lands; and
- c) improving the quality of fresh water in water bodies that have been degraded by human activities to the point of being over allocated.”

Supporting these objectives are four policies within the NPSFM which amongst other things, require Regional Councils to establish freshwater objectives, set quality limits, and avoid over-allocation.

[296] Those provisions need to be read alongside Objective C1 of the NPSFM which requires the integrated management of freshwater and the use and development of land ‘in whole catchments’. Policies supporting this objective include a requirement for Regional Councils to manage freshwater and land use and development in an integrated and sustainable way.

Proposed Plan Change 5

[297] This proposed plan change represented a first step by the HBRC towards implementing the NPSFM. It amends the RRMP by introducing a new section at the beginning of Chapter 3 which is headed “Integrated Land Use and Freshwater Management”.

[298] A suite of objectives and policies in PC5 seek to achieve integrated management of the complex inter relationship between water quality and land use. The first Objective, OBJ LW1, includes a number of matters:

- “1. protecting the quality of outstanding freshwater bodies in Hawke’s Bay;
- 1A. protecting the significant value of wetlands;
- 2. the improvement of water quality in water bodies that have been degraded;
- 2B. avoiding any further over allocation of freshwater and phasing out existing over allocation;
- 3. recognising that land uses, freshwater quality and surface water flows can impact on the receiving coastal environment;
- 4. safeguarding the life supporting capacity and ecosystem processes of freshwater, including indigenous species and their associated freshwater ecosystems;
- ...
- 6. recognising the significant Regional and National importance of freshwater use for production and processing of beverages, food and fibre;
- ...
- 8. recognising the benefits of industry good practice to land and water management;
- ...

10. recognising and providing for wairuatanga and the mauri of freshwater bodies in accordance with the values and principles expressed in Chapter 1.6, Schedule 1 and the Objectives and Policies in Chapter 3.14 of this Plan;
- ...
13. recognising and providing for the recreational and conservation values of freshwater bodies.”

As already mentioned, further Objective OBJ LW2, also deals with the integrated management of water and land use. Both objectives are supported by a number of policies, which promote a catchment-based approach to integrated management. In this way PC5 lays the foundation for PC6.

The water quality provisions in PC6

[299] Of the five objectives in PC6 three are directly relevant to water quality.

[300] The first is OBJ TT1 which sets goals for the Tukituki catchment based on the values attributed to the five management zones.¹²⁷ Those values, which were the subject of specific study and assessment¹²⁸, are summarised in table 3 from the s 32 Evaluation Report reproduced on Figure 7 below:¹²⁹

Description of Water Management Zones Zone No.	Zone Name	Description	Key values
Zone 1	Lower Tukituki	Includes the mainstem of the Lower Tukituki River below the confluence with the Waipawa River and a number of the small sub-catchments which drain the eastern boundary of the Tukituki Catchment	Contact recreation and angling (mainstem) Trout and native fishery, particularly īnanga spawning (mainstem) Life-supporting capacity (all)
Zone 2	Ruataniwha Basin (north)	The boundary with Zone 3 is the Waipawa river and the remaining boundaries are the surface water catchment boundaries of the tributaries that feed into the Waipawa River	Native fish and trout habitat (all) Life-supporting capacity (all)

¹²⁷ Figure 3 at paragraph [146] above.

¹²⁸ T Sharp, Tukituki Catchment, Freshwater Values Assessment, March 2012, Folder 2 of Plan Change application documents, Tab 1.

¹²⁹ H Codlin and R van Voorthuysen, Section 32 Evaluation Summary Report for proposed Plan Change 6 Tukituki River Catchment, adopted by council on 24 April 2013, Folder 1 of Plan Change application documents, Tab 3, page 17.

Zone 3	Ruataniwha Basin (south)	As for Zone 2. Includes a number of tributaries that have their headwaters in the foothills of the catchment, as opposed to the Ruahine Ranges	Native fish and trout habitat (all) Life-supporting capacity (all)
Zone 4	Headwater rivers	Contains the headwater catchments of the Tukituki, Waipawa and the Makaroro Rivers	Maintain current biodiversity levels (all) Native fish and trout spawning habitat (all) Life-supporting capacity (all)
Zone 5	Papanui-Otane	This catchment feeds into the Lower Tukituki (Zone 1). Its boundaries are based on surface water catchments and it contains the Otane aquifer system	Native fish habitat (all) Life-supporting capacity (all)

Figure 7: description of water management zones.

The s 32 Evaluation Report explains that the five water management zones and the different values and uses they support, that were used to set the water quality limits.

[301] Whether the water quality limits in PC6 are appropriate for, in particular, maintaining or enhancing the life supporting capacity of ecosystems within the catchment and maintaining the mauri of the catchment as a whole, is a key point of contention between the parties. Further, the ‘life-supporting capacity’ that featured in the above Table was not carried through to the Tukituki Choices discussion document. Instead the latter document focussed on excessive periphyton growth as a key issue in the catchment.¹³⁰

[302] OBJ TT2 is the second objective directly bearing on water quality. It provides that where the quality of freshwater has been degraded by human activities to such an extent that OBJ TT1 is not being achieved, water quality should not be allowed to degrade further. Rather water quality should be improved progressively over time so that OBJ TT1 is achievable by 2030 (which is the year by which the NPSFM is to be implemented).

¹³⁰ Tukituki Choices –a discussion of choices and opportunity for land and water management, September 2012, page 11.

[303] The third objective is OBJ TT4A which was introduced following the conferencing of expert planning witnesses¹³¹. This objective indicates recognises that industry good practice for land and water management could assist with achieving the other freshwater objectives. The Board might go so far as to say that implementation of industry good practice for land and water management is *essential* if the freshwater objectives within the Tukituki catchment are to be achieved.

[304] Arising from those objectives is the nutrient management framework in the PC 6 POL TT1 to TT6 (inclusive). These policies cover surface and groundwater limits, targets and indicators; specific provision for point source discharges; the means by which limits and targets will be implemented for nitrate-nitrogen and phosphorus; and the decision-making criteria that is to apply to production land.

[305] The Board will return to specific policies as necessary. At this stage it is only necessary to reproduce the five tables below from PC6 (as at 19 January 2014)¹³² showing the water quality limits, targets and indicators currently proposed. These will provide a background for the discussion that follows.

Table 5.9.1A: Surface Water Quality Limits and Targets for the Tukituki River Catchment — Catchment Wide

Parameter	Limit or Target
Temperature	The temperature of the water shall be suitable for sustaining the aquatic habitat.
Dissolved Oxygen	The concentration of dissolved oxygen shall exceed 80% of the saturation concentration except in areas of groundwater upwelling including the Porangahau, Maharakeke, Kahahakuri, Mangaonuku, Papanui sub-catchments.

¹³¹ Expert Conferencing Joint Witness Statement to the Board of Inquiry - Planners (Change 6), 22 October 2013, page 7.

¹³² Exhibit 90 - Plan Change 6, 19 January 2014.

<i>E. coli</i>	<p>260 <i>Escherichia coli</i> per 100 millilitres for the 1 November to 30 April bathing season (for flows below the median flow).</p> <p>550 <i>Escherichia coli</i> per 100 millilitres for the 1 November to 30 April bathing season (for flows between the median flow and three times the median flow).</p> <p>550 <i>Escherichia coli</i> per 100 millilitres for the rest of the year (for flows below three times the median flow).</p> <p>The methodology for compliance is a maximum 95th percentile calculated as a minimum of 20 sampling points.</p>
Total Ammoniacal Nitrogen (TNH ₃ -N)	99% species protection level for total ammoniacal nitrogen (TNH ₃ -N) as stipulated in the most recent version of the Australian and New Zealand XX note that this table is truncated Guidelines for Fresh and Marine Water Quality (the ANZECC guidelines) and as tabulated in Schedule XXIII. ²⁷
Other Toxicants	<p>95% species protection levels for toxicants (other than nitrate-nitrogen and total ammoniacal nitrogen) as stipulated in the most recent version of the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (the ANZECC guidelines) for Water Management Zones 1, 2, 3 and 5.²⁶</p> <p>99% species protection levels for toxicants (other than nitrate-nitrogen and total ammoniacal nitrogen) as stipulated in the most recent version of the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (the ANZECC guidelines) for Water Management Zone 4.²⁷</p>

Table 5.9.1B: Surface Water Quality Limits, Targets and Indicators for the Tukituki River Catchment — Zone Specific.

Water Management Zone	Mainstems/ Tributaries ¹³³	Periphyton Limits and Targets				DRP Limits and Targets	Nitrate-nitrogen Limits and Targets		DIN Limits and Targets	Indicators	
		(a)	(b)	(c)	(d)		(a)	(b)		Water Clarity	MCI
Zone 1 Lower Tukituki and Waipawa Rivers and Tributaries (excluding Papanui Stream catchment)	Mainstems					0.010				2.8	100
	Tributaries	120	30	60	50	0.015	2.4	3.5	n/a	1.6	100

Water Management Zone	Mainstems/ Tributaries ¹³³	Periphyton Limits and Targets				DRP Limits and Targets	Nitrate-nitrogen Limits and Targets		DIN Limits and Targets	Indicators	
		(a)	(b)	(c)	(d)		(a)	(b)		Water Clarity	MCI
Zone 2 Middle Waipawa River and Tributaries above SH2	Waipawa River	12 0	30	60	50	0.010	3.8	5.6	n/a	3.0	120
	Mangaonuk u Stream									4.0	
	Tributaries					0.015				1.6	100
Zone 3 Middle Tukituki River and Tributaries above Tapairu Road	Mainstems	12 0	30	60	50	0.010	3.8	5.6	n/a	3.0	120 ¹³⁴
	Tributaries					0.015				1.6	100
Zone 4 Upper Tukituki and Waipawa Rivers	All	50	30	60	50	0.004	n/a	1.5	0.150	3.3	120
Zone 5 Papanui Stream	All	12 0	30	60	50	0.015	2.4	3.5	n/a	1.6	100

Table 5.9.1C: Surface Water Quality Deposited Sediment Indicators for the Tukituki River Catchment — Zone Specific.

W	Deposited Sediment Indicators
Zone 1 Lower Tukituki and Waipawa Rivers and Tributaries (excluding Papanui Stream)	10% in the Waipawa and Tukituki Rivers and 20% in all other naturally hard bottomed streams and rivers
Zone 2 Middle Waipawa River and tributaries above SH2	10% in the Waipawa River and Mangaonuku Stream and 20% in all other naturally hard bottomed streams and rivers

Zone 3 Middle Tukituki River and tributaries above Tapairu Road	10% in the Tukituki, Tukipo and Makaretu rivers and 20% in all other naturally hard bottomed streams and rivers (including Maharakeke, Porangahau and Kahahakuri Streams)
Zone 4 Upper Tukituki and Waipawa Rivers	10% in all naturally hard bottomed streams and rivers (including Tukituki, Waipawa and Makaroro Rivers)
Zone 5 Papanui Stream	20% in the Papanui Stream and all other naturally hard bottomed streams and rivers

Table 5.9.1D: Maximum Allowable Catchment Nitrogen Load (MACNL)

Maximum Allowable Catchment Nitrogen Load	Tonnes Nitrogen per Year
Above Black Bridge	5,060

Table 5.9.2: Groundwater Water Quality Limits and Indicators Applicable 10m or More Below Ground Level in Productive Aquifer Systems

Aesthetic determinands	<i>E. coli</i>	Nitrate-nitrogen	Nitrate-nitrogen Indicator	All other determinands
Guideline value for any aesthetic determinand [Drinking-Water Standards for New Zealand (DWSNZ)]	Maximum concentration of <i>Escherichia coli</i> per 100 millilitres	Maximum 95 th percentile concentration of nitrate-nitrogen (mg NO ₃ -N /L)	Maximum annual average concentration of nitrate-nitrogen (mg NO ₃ -N /L)	All other inorganic or organic determinands of health significance [DWSNZ]
Within guideline	<1	11.3	5.65	Maximum acceptable value (MAV)

The numerical values in these tables are treated as ‘limits’ at locations where the existing water quality is better than the relevant numerical value. At locations where the existing water quality is worse than the relevant numerical value they are treated as ‘targets’.

Periphyton

[306] Many of the submissions and much of the discussion throughout the hearing focussed on the issue of periphyton which is defined in PC6 as:

“A complex mixture of algae and slimes that attach to submerged surfaces in rivers.”

Periphyton is a naturally occurring phenomenon and forms an essential part of freshwater ecosystems, being an important source of food for fish and aquatic invertebrates.

[307] To the lay person however, periphyton, or rather excessive growths of periphyton, are the slimy, green, filamentous algae mats that clog the waterways. Inevitably periphyton makes the use of waterways for recreational activities such as fishing and swimming very unpleasant.

[308] A distinction needs to be drawn between the existence of periphyton in a naturally occurring balanced ecosystem and excessive or nuisance periphyton. The latter occurs in situations where the nutrient balance of the aquatic ecosystem changes through anthropogenic activities such as the ‘run off’ from farming and intensive land uses.

[309] PC6 is intended to manage excessive or nuisance periphyton growth. Specifically OBJ TT1(c) states that the Tukituki catchment is to be managed so that:

“The frequency and duration of excessive periphyton growths that adversely affect recreational and cultural uses and amenity are reduced.”

‘Excessive periphyton growths’ are defined in a footnote to the objectives as growths that exceed the periphyton limits and targets set out in Table 5.9.1B.

[310] At conferencing of the water quality experts there was a large measure of agreement about periphyton biomass and cover limits. The joint witness statement records:¹³⁵

“... ”

- a) We agree that the periphyton biomass numbers/thresholds (mg chlorophyll a/m²) set in Change 6 are appropriate. (AGREED: KM, OA, AU, TS)
- b) We agree that periphyton biomass should in the future be used for reporting, model development and to assist in the development of

¹³⁵ Expert Conferencing Joint Witness Statement to the Board of Inquiry – Change 6 periphyton limits, 12 November 2013, paragraph 1 and 2. .

statistical relationships between periphyton biomass and periphyton cover (% cover). (AGREED: KM, OA, AU, TS)

- c) We understand that periphyton biomass will be monitored at a small sub-set of sites across the Tukituki catchment. The current proposal is to monitor periphyton biomass monthly at three sites on the Tukituki River: SH50, Tamumu Bridge and Red Bridge. (AGREED: AU, TS, KM, OA)
 - d) More data [is] required to understand the differences in compliance with periphyton cover vs periphyton biomass limits, and we recommend that periphyton biomass samples be also collected when and where periphyton cover limits or targets are exceeded. (AGREED: AU, TS, KM, OA)
2. With regards to periphyton cover limits/targets
- a) We agree that the periphyton cover limits/targets set in Change 6's Table 5.9.1.B are based on the 2000 New Zealand Periphyton Guidelines (Biggs, 2000) and are appropriate (AGREED: TS, AU, OA) (KM: Partial agreement, on the basis that the filamentous cover limits (30% cover) are adequate for aesthetic and recreational values, but the mat cover limit as proposed (60% cover) are too permissive in cyanobacteria-dominated communities for aesthetic and ecological values).
..."

All the experts also agreed that the use of 'periwcc', which is an integrated measure of percentage periphyton cover, is a useful simplified measure of periphyton cover.

[311] The remaining disagreement between the experts involved the numerical thresholds for periwcc cover in certain parts of water management zones 2 and 3. However, given the agreement reached on periphyton limits and targets in Table 5.9.1B this is largely academic and the Board will accept the agreement reached by the expert witnesses.

[312] While the limits and targets were agreed, there was considerable disagreement between the experts about whether periphyton growth in the catchment was nitrogen limited, phosphorus limited, or co-limited. When formulating PC6 HBRC adopted the position that the Tukituki catchment is phosphorus limited, and that increases in nitrogen levels will not significantly add to periphyton, growth in the catchment. Whether this is right is a fundamental issue.

Nutrient limitation

[313] Nutrient limitation refers to a state of affairs in the nutrient balance (in the main between phosphorus and nitrogen) where the concentration of one or other nutrient is in short supply. Where periphyton growth in a water body is said to be phosphorus limited the extent of periphyton growth is dependent upon the instream concentration of phosphorus. Consequently an increase in phosphorus will increase the periphyton biomass.

[314] In water bodies that are phosphorus limited, increases in the concentration of nitrogen will not illicit a substantial increase in periphyton biomass. Similarly, if a water body is nitrogen limited, growth of periphyton is dependent upon the existence of nitrogen concentrations in the water body. Thus any increase in nitrogen concentrations will increase periphyton biomass.

[315] Periphyton growth is said to be ‘co-limited’ where increases in concentration of either phosphorus or nitrogen will elicit a response in the form of increased periphyton growth.

[316] The HBRC case concerning periphyton growth was based on the proposition that the Tukituki catchment is phosphorus limited in terms of the ‘Redfield ratios’. These ratios refer to the relationship (in concentration terms) between phosphorus and nitrogen within plant or algae cells. Ratios greater than 20 to 1 are considered to be phosphorus limited and those less than 10 to 1 are nitrogen limited. For values between 10 to 1 and 20 to 1, Dr Russell Death, an Associate Professor in Freshwater Ecology (for Fish and Game), described the distinction as “not clear”, although it is anticipated that all co-limited waters will fall somewhere in between.

[317] It appears that two fundamental propositions underlie the HBRC approach to nutrient management in PC6. The first is that the Tukituki catchment as a whole is over allocated for phosphorus but under allocated for nitrogen.¹³⁶ However, whether the catchment is under or over allocated for nitrogen depends on the limits and targets that

¹³⁶ R van Voorthuysen, Evidence in Chief, paragraph 13.4.

are set. If limits lower than the toxicity derived limits currently in PC6 are adopted much of the catchment would be over-allocated for nitrogen.

[318] The second proposition is that water quality should be defined in a manner that is consistent with the United Nations definition of water quality,¹³⁷ namely:

“From a management perspective, water quality is defined by its desired end use. Consequently, water for recreation, fishing, drinking and habitat for aquatic organisms require higher levels of purity, whereas for hydro power, quality standards are much less important. For this reason, water quality takes on a broad definition as the “physical, chemical, and biological characteristics of water necessary to sustain desired water uses”.

Mr van Voorthuysen understood this definition to mean that water quality comprises *actual observable outcomes* such as periphyton levels, macrophytes, macro-invertebrate communities, water clarity and sedimentation, rather than particular concentrations of one or more chemical constituents.¹³⁸ The Board has reservations about this proposition, particularly whether it would give effect to the NPSFM.

[319] In any event PC6 proceeds on the basis that the growth of nuisance periphyton in the Tukituki catchment is phosphorus limited. Consequently the management regime for nitrogen is much more ‘hands off’ than for phosphorus, and substantial increases in nitrate-nitrogen could occur. Those challenging this approach contend that at the very least the catchment is co-limited, with nitrogen limitation being demonstrated at different times and at various locations throughout the catchment.

Should there be single or dual nutrient control?

[320] Much of the discussion and difference of opinion between experts revolved around whether PC6 should manage just phosphorus or whether it should manage *both* phosphorus and nitrogen. This was paraphrased as a discussion about ‘single or dual nutrient’ control.

[321] Given that PC6 actually includes some controls in respect of nitrogen, the description that it is a ‘single nutrient’ regime might at first sight seem to be a

¹³⁷ O Ausseil, Evidence in Chief, paragraph 14.4.

¹³⁸ R van Voorthuysen, Evidence in Chief, paragraph 10.1.

misnomer. But the reality is that in focusing on the toxicity effects of nitrogen as opposed to the ecological health of the catchment, the control of nitrogen within PC6 is relatively ‘hands off’:

- in some situations there can be an increase of up to 30% in leaching rates without the need for a resource consent being triggered;
- instream nitrate-nitrogen levels are set by reference to *toxicity levels* which are relatively high;
- the maximum allowable catchment load for nitrogen of 5060 tonnes represents a substantial increase above the current load;
- implementation of specific controls over nitrate-nitrogen have been largely deferred pending collaboration with the primary sector and a Plan Change in 2018;
- all of these can be contrasted with the much more stringent controls for phosphorus.

Given that situation the Board can understand the impression of the parties that PC6 as proposed by HBRC is essentially a ‘single nutrient’ regime.

[322] For a number of reasons the Board has concluded that this ‘single nutrient’ approach is unsatisfactory and does not give effect to the NPSFM.

[323] First, the evidence supporting the underlying premise that the catchment as a whole is phosphorus limited is equivocal, to say the least. For example, the 2013 report on the Tukituki River catchment entitled *Managing Nuisance Growth Using Nutrient Limits* states:

“The lower Tukituki River (taken throughout this report as the reach of the Tukituki River from State Highway 2 to the river mouth) is generally P limited,

although N limitation can occur at and downstream of Red Bridge during periods of very low flows in summer.”¹³⁹

Given the proximity of the river “at and downstream of Red Bridge” to the main urban areas of Hawke’s Bay and the likelihood that people will be accessing that reach of the river during summer months, this is a very significant acknowledgment.

[324] This acknowledgment is also consistent with other evidence the Board heard about the variation in nutrient limitations both spatially and temporally across the catchment.¹⁴⁰ These aspects were referred to by Mr van Voorthuysen:¹⁴¹

“I acknowledge that the change 6 focus on a single nutrient management regime (reducing Phosphorus levels while allowing some increase in Nitrogen levels) for managing periphyton has some risks. In particular, I understand from Dr Uytendaal that in the late summer months the lower Tukituki River can have very low Nitrogen levels and so if Nitrogen levels increase over time there is a risk that additional periphyton growth (including cyanobacteria) could occur in that part of the river. This has led a number of the experts (including Dr Ausseil, Dr Wilcock and Dr Young) to conclude that the management of Phosphorus levels is very important.”

While the Board has no doubt that the management of phosphorus levels is extremely important, for present purposes the issue is whether there should also be a more stringent *nitrogen* regime. The Board believes that there should be.

[325] Secondly, the Board questions the approach to the management of nitrogen based on toxicity and whether this is appropriate to achieve the key values identified in the s 32 analysis and elsewhere for water management Zones 1 to 5. Dr Death explained¹⁴²:

“Nitrogen/Nitrate should be managed for ecological health levels not toxicity. Significant adverse effects on life supporting capacity will occur long before the toxic effects of nitrates will be observed.”

¹³⁹ Technical Workshop, Tukituki River Catchment - Managing Nuisance Growth Using Nutrient Limits, January 2013, Folder 4 of Plan Change application documents, Tab 3, page 10.

¹⁴⁰ J Abell, Tukituki Catchment Proposal Hearing Transcript, page 2392.

¹⁴¹ R van Voorthuysen, Evidence in Chief, paragraph 42.4.

¹⁴² R Death, Evidence in Chief, paragraph 2.9.

He likened this to the effect of alcohol. Long before a person consumes so much alcohol that he or she is poisoned, that person will usually have become very unhealthy.¹⁴³

[326] As a measure of ecological health, Table 5.9.1B of PC6 includes the Macroinvertebrate Community Index (MCI) as an ‘indicator’. Dr Olivier Ausseil on behalf of HBRC explained¹⁴⁴:

“The MCI is the most commonly used indicator of macroinvertebrate community health in large scale monitoring and reporting in New Zealand, such as State of the Environment monitoring and reporting undertaken by Councils. In view of the Change 6 freshwater objectives for the Tukituki River catchment, the MCI is, in my opinion, best suited as an overall indicator of stream “health” in relation to ecological, recreational and cultural values.”

[327] In response to submissions seeking different MCI indicators Dr Ausseil said:¹⁴⁵

“Some submitters seek that different MCI limits be applied. The process followed for the definition of the MCI indicator thresholds in Change 6 is set out in the water quality limits technical report⁷). Essentially a score of 120 was considered unrealistic for the lower Tukituki River, due to its natural characteristics. Essentially, an “indicator” score of 120, indicative of “Excellent” water quality, is recommended in all streams of Zone 4, as well as for all the mainstem rivers of Zones 2 and 3. An “indicator” minimum score of 100, indicative of “Good” water quality is recommended for smaller tributaries of Zones 2 and 3, owing to their soft sedimentary nature and their lesser trout habitat and trout spawning values. A score of 100 is also recommended for the lower Tukituki River, owing to the likely effects of elevated water temperatures on sensitive macroinvertebrate taxa, and the limited means by which water temperature can be influenced in that reach (refer to Section 7). Essentially a score of 120 was considered unrealistic for the lower Tukituki River, due to its natural characteristics.”

Dr Ausseil supported the MCI scores contained in PC6¹⁴⁶. Dr Death agreed that “The limits for MCI and periphyton for each of the zones provide appropriate and pragmatic limits based on my research and experience.”¹⁴⁷

¹⁴³ RDeath, Evidence in Chief, paragraph 7.2.

¹⁴⁴ O Ausseil, Evidence in Chief, paragraph 6.4.

¹⁴⁵ O Ausseil, Evidence in Chief, paragraph 6.11.

¹⁴⁶ O Ausseil, Evidence in Chief, paragraph 6.12 and A Uytendaal and O Ausseil, Tukituki Catchment: Recommended Water Quality Limits and Targets for the Tukituki Plan Change 6, February 2013, Folder 4 of Plan Change application documents, Tab 1.

¹⁴⁷ R Death, Evidence in Chief, paragraph 7.11.

[328] In his evidence in chief¹⁴⁸ and in response to questions from the Board Dr Death related the accepted MCI indicator values to the nutrient levels required to achieve those MCI parameters. The transcript records¹⁴⁹:

“Commissioner Howie: Okay. In the proposed plan change there is a table that has got MCI numbers in it.

Dr Death: Yes.

Commissioner Howie: Are you happy with those numbers?

Dr Death: The MCI numbers, but I actually calculated what I believe the nitrogen level should be. So in my evidence in chief in my table on page 17 – so the Hawke’s Bay Regional Council have suggested some MCI for different water management zones and I think they’re good pragmatic MCI choices but I’ve used my FAT model to work out what DRP levels should be in the river to get those MCIs and I agree completely with what HBRC have got there. I get exactly the same answers. But with the nitrate ones the MCIs that I would get out of that are much lower than what they’re aiming for. I think it’s in column 1, 2, 4, 5 – column 6 I’ve got the MCI predicted from the nitrate limit using the FAT model which I’ve used and you can see that mine are quite a bit lower than what HBRC are aiming at.

Commissioner Howie: Can you give us an example of the number?

Dr Death: So in the first line HBRC a main stem of water management zone 1. They’ve got an MCI of 100. Using my model I would predict that an MCI with the nitrate level that they have as their limit and target of 2.4 would result in an MCI of 90.

Commissioner Howie: Okay, I understand. So where would – if it’s dependent on your nitrogen limit if you work backwards and you put 100 in instead of your 90, what do you get for the nitrogen concentration?

Dr Death: Just give me a second. It’s 0.8.

Commissioner Howie: 0.8. That’s sort of where I think it was Dr Abell drew the curves that had flattened off at 0.8?

Dr Death: Yes, and that was for periphyton which, to me, periphyton is a really hard thing to manage it just varies so much. With the MCI, if you go out to a river and, you know, nobody’s badly polluted it, it’s quite constant in time, irrespective of the time of year or season or even from year to year unless anything dramatic has changed. So in my opinion it’s a much better management tool and in fact

¹⁴⁸ R Death, Evidence in Chief, table 1, page 17.

¹⁴⁹ R Death, Tukituki Catchment Proposal Hearing Transcript, Page 2460.

most regional councils monitor MCI. Very few actually monitor periphyton because it's not that good, it just varies so much.

Commissioner Howie: The plan change has MCI as an indicator, is that how you would see it?

Dr Death: No, I would like to see it as a limit. As I said I think it's the best measure of ecosystem health and if I wanted to manage a system to be healthy or not that's what I would have as the best measure.

Commissioner Howie: Okay.

DR DEATH: Because, as I said, the periphyton stuff just varies so much in time. The nutrient concentrations again, you know, you can go out 12 o'clock, go out at 3 o'clock and the nutrient concentrations could have doubled. I have actually sampled periphyton where I have gone out one day, gone to the same site the next day, nothing's happened and the periphyton biomass is tripled overnight. You really just don't appreciate how quickly this stuff can grow sometimes.

Commissioner Howie: So if they were limits in the plan change would those numbers there be what you would pick?

Dr Death: Yes, they are quite well established in New Zealand as criteria for the MCI, 120, 100, 80, they are again used by most regional councils and well established in freshwater management."

[329] Dr Adam Uytendaal¹⁵⁰ and Dr Roger Young¹⁵¹ who were representing the applicants, were critical of the Freshwater Animal Thresholds (FAT) model developed by Dr Death and questioned its application to the Tukituki River. In answer to that criticism Dr Death pointed out that the model had been applied in a different way by Drs Uytendaal and Young and that the model required use of long term median nitrate concentrations and median MCI to demonstrate a relationship, not examination at a point in time.¹⁵² Under cross examination the following exchange occurred:

"Mr Robinson: And in terms of the test that you pose in relation to TRIM, which I quote from your 6.2, "To conclude any model without any measure of how good that model is provides no useful information."

¹⁵⁰ A Uytendaal, Rebuttal Evidence, paragraph 5.1 to 5.4.

¹⁵¹ R Young, Rebuttal Evidence, paragraphs 8.2 and 8.3.

¹⁵² R Death, Tukituki Catchment Proposal Hearing Transcript, Page 2455.

Can I put to you that if you haven't plotted against the Tukituki in data and verified its accuracy or otherwise, then that is effectively what you are doing, you are not providing a measure of how good the model is at that location?

Dr Death: I have got a measure of how good the model is, whether or not it applies in other scenarios, yes, it would need testing. However, it has been used in the Canterbury region and the parliamentary Commissioner for the Environment included it in their latest report on the effects of dairy intensification.

The same invertebrates are involved, the same kind of rivers and streams and the same nutrients, nitrogen and phosphorus don't differ. As I have already alluded to, I believe the MCI only indicates nutrient levels and MCI is applied throughout New Zealand by all regional councils, it doesn't just apply in the Manawatu. Hawke's Bay uses it, the upper headwaters of the Manawatu which is where I did most of my sampling is only about 60 kilometres away from the Tukituki, so I can't see any reason why it wouldn't apply."

[330] The Board find Dr Death's correlation of the desired MCI levels with an empirical DIN level useful. An indicator of ecological health such as MCI which is not related to a measurable water quality nutrient concentration would be problematic. But the DIN value of 0.8mg/l is the upper limit of Dr Death's 0.085mg/l to 0.8mg/l range and can therefore be seen as the absolute maximum concentration that could achieve the indicated MCI levels. As water quality science advances a different DIN limit may emerge as a more appropriate level. In the meantime the Board sees the DIN limit of 0.8mg/l as a pragmatic level that balances ecological health with the desire for more intense land use.

[331] This issue of ecological health was further explored during questioning by the Board:¹⁵³

"Mr Lawson: Is it that the table in the plan change at the moment is aiming at toxicity thresholds whereas you are talking more about ecosystem health, is it as stark as that?

Dr Death: Yes, that's correct. I mean ecosystems are going to be degraded at much lower levels. The toxicity is where the nitrate becomes a poison and I use the analogy of alcohol, that very few people die from alcohol poisoning, that's the nitrate toxicity level, but a lot of people get quite sick when they drink a reasonable level. And in fact you need a little bit of nitrate in the system to make it function correctly and certainly again a lot of people like a little bit of alcohol to keep them functioning.

¹⁵³ Tukituki Catchment Proposal Hearing Transcript, Page 2463.

Mr Lawson: So if we are then looking at the national policy statement and the objective there, the objective is to safeguard the life supporting capacity, ecosystem processes and indigenous species including their associated ecosystems of freshwater and sustainably manage use and development. What level do you believe is necessary to achieve that objective, is it toxicity or is it lower figure?

Dr Death: No, I think toxicity is a poison and you will have very degraded life supporting capacity long before you get to that level. The life supporting capacity I believe refers to ecosystem health. Some of those levels of toxicity are the levels that many of the most polluted rivers in the world have. I think Dr Abell mentioned that there really are none in New Zealand which have those levels of nitrogen in them at the moment. And if we are going to move up to 3.8 milligrams that's the kind of concentrations which are in the Thames and the Ebro, the very polluted rivers in the world.

Mr Lawson: Just going back to your table, the table that you have got there. The Hawke's Bay Regional Council nitrogen limits and targets at 2.4 and 3.8, that's milligrams per litre?

Dr Death: Mm'hm.

Mr Lawson: And you are saying that range should be 0.085 to 0.8?

Dr Death: Yes.

Mr Lawson: That's a significant difference in those concentrations?

Dr Death: And that's the difference between nitrate affecting ecosystem health and nitrate acting as a poison."

Dr Death was suggesting that the preservation of ecological health as indicated by the MCI required an instream nitrate-nitrogen limit within the 0.085mgN/l to 0.8mgN/l range.

[332] The Board accepts that an approach based on *ecological health* rather than *toxicity* is more likely to give effect to the NPSFM. Such an approach would also appear to be consistent with the approach of the Environment Court in *Day v The Manawatu Wanganui Regional Council*.¹⁵⁴

[333] Thirdly, the single nutrient approach seems to involve a high level of risk. Dr Ausseil acknowledged that the general scientific position was 'clear' in that managing both nitrogen and phosphorus "is a more environmentally conservative

¹⁵⁴ Day v Manawatu–Wanganui Regional Council [2012] NZEnvC 182 (5–155)

approach and that in not doing so, that is, managing only one nutrient incurs a number of risks”.¹⁵⁵

[334] The first of those risks is that nutrient limitation varies spatially and temporally within the catchment. As far as the Board could see this was acknowledged by all the expert witnesses. In particular Dr Ausseil accepted that periphyton growth could be caused by the addition of a nutrient in one part of the catchment but not in others.¹⁵⁶ Temporal variability indicates that there could also be seasonal variation.

[335] Another risk identified by Dr Ausseil is that the system becomes more reactive to one nutrient if the other nutrient is present in excess. He stated that this means that if one nutrient, for example DIN, is supplied in excess of algal growth requirements, then the system is likely to be much more reactive to increased inputs of phosphorus. That stands to reason. If nitrogen levels are allowed to increase significantly to near toxicity levels any addition of phosphorus is likely to elicit an almost immediate and substantial response.¹⁵⁷

[336] A third risk involves downstream environments, including the estuarine and coastal environment. If nutrients are not properly managed upstream an adverse effect downstream is virtually inevitable.¹⁵⁸

[337] Given that these risks can be reduced by a ‘dual management’ approach, the Board is of the clear view that a dual management regime should be preferred. Apart from reducing the risk element, such an approach is much more likely to give effect to the NPSFM.

[338] Fourthly, the Board remains unconvinced that the ‘Redfield ratios’ justify the single nutrient approach. As already mentioned, these ratios (which relate to the molar ratio of nitrogen to phosphorus within plant cells) were used by HBRC as a benchmark for assessing nutrient limitation in the ambient water.

¹⁵⁵ O Ausseil, Evidence in Chief, paragraph 9.9.

¹⁵⁶ O Ausseil, Evidence in Chief, paragraph 9.9.

¹⁵⁷ O Ausseil, Evidence in Chief, paragraph 9.9.

¹⁵⁸ O Ausseil, Evidence in Chief, paragraph 9.9.

[339] Under questioning from the Board, Dr Jonathan Abell, an Aquatic Scientist called by Fish and Game, further explained that the Redfield ratio refers to the intra-cellular concentrations of those nutrients within the cell and has been used in PC6 as an indication of the relative concentrations in the ambient water. He also explained that it is not an “absolute direct relationship”, particularly in the case of periphyton and rivers, and that there is a lack of correlation between the Redfield ratio within cells and the ambient water.¹⁵⁹

[340] The evidence established that this is because phosphorus binds readily to soils and sediments which effectively provide a reservoir of phosphorus within the river sediments. While that reservoir might be there as a result of residual levels of phosphorus, it is more likely to be associated with the deposition of sediments as a result of high sediment loads in the river during high flows.

[341] Describing phosphorus chemistry as ‘incredibly complex’, Dr Abell explained:¹⁶⁰

“...

there [are] rapid absorption and desorption processes that occur over time scales of minutes to hours. That is less related to anoxia. More related to the ambient DRP [phosphorus] concentration and the specific characteristics in the sediments and that varies widely. And that’s a process that hasn’t been included for example in the TRIM [model] and it’s understandable because it’s fiendishly complex and it requires lots of information.

But that process leads to something called nutrient spiralling so you might get Phosphorus released from the bed at the top of the catchment and that that Phosphorus atom is combined into biomass and then that decays and mineralises and that it is absorbed again by sediments and its released many many times. In this issue of – call it the legacy effect of Phosphorus is something that I think perhaps is not accounted for in TRIM and it’s a primary reason that’s been highlighted in the many studies to explain why water quality improvements following Phosphorus controls have been disappointing in places such as St Lawrence River Catchment in Canada, Lake Eyre, North America, River Swale in the UK, many examples and that is due to this lag effect. So Phosphorus has an affinity for sediments... as a catchment that has been farmed, I believe, for at least 100 years, in places there will be a surplus of Phosphorus in the soils and – even if you were to stop farming on a paddock tomorrow, that will still provide a long term source of Phosphorus until those soil Phosphorus decline and that would be a source over, literature tells us in the order of years to decades, so it’s an important consideration.”

¹⁵⁹ J Abell, Tukituki Catchment Proposal Hearing Transcript, Page 2399.

¹⁶⁰ J Abell, Tukituki Catchment Proposal Hearing Transcript, Page 2397.

Dr Death reinforced these conclusions by reference to two recent reviews of scientific studies (totalling over 600 studies) which found that the Redfield ratios are not accurate for determining nutrient limitation.¹⁶¹

[342] As Dr Death saw the matter, use of the Redfield ratios to support conclusions about the limiting nutrient in the Tukituki catchment was “flawed and should be ignored”.¹⁶² He considered that a more effective means of assessing which nutrient is limiting is the “deployment of nutrient diffusing substrates”.¹⁶³ Dr Death noted that HBRC had conducted 21 nutrient diffusing substrate studies between 2008 and 2011 and that in addition he had personally conducted nutrient diffusing substrate studies in fifteen Tukituki water bodies¹⁶⁴.

[343] The result of those studies was explained by Dr Death¹⁶⁵:

“Nine of the 21 studies conducted by Hawke’s Bay Regional Council and 4 of the 15 studies conducted by myself indicated co-limitation by Nitrogen and Phosphorus. Five HBRC and no Massey studies indicated Phosphorus was limiting and one each in Hawke’s Bay Regional Council and Massey indicated Nitrogen was limiting. 6 of the Hawke’s Bay Regional Council and 10 of the Massey NDS sites indicated no limitation.”

The accuracy of these results were not challenged and the Board believes that they provide strong evidence that the catchment is, at different times and at different locations nitrogen limited, phosphorus limited and co-limited.

[344] Having reviewed all the information that he considered to be relevant Dr Death posed the question: ¹⁶⁶

“So what does this mean for nutrient limitation in the Tukituki Catchment? I think evidence on what nutrient is limiting and when is still highly uncertain as nutrient limitation status changes with the site, season, and flow. However, as (Wilcock et al. 2007) in a review of Limiting Nutrient Management in New Zealand stated in the executive summary “applying controls only to the “limiting” nutrient (and not the other nutrient) is not recommended.

¹⁶¹ R Death, Evidence in Chief, paragraph 3.4.

¹⁶² R Death, Evidence in Chief, paragraph 3.4.

¹⁶³ R Death, Evidence in Chief, paragraph 3.5.

¹⁶⁴ R Death, Evidence in Chief, paragraph 3.6.

¹⁶⁵ R Death, Evidence in Chief, paragraph 3.7.

¹⁶⁶ R Death, Evidence in Chief, paragraph 3.10 and 3.11.

Nutrient limitation for unwanted algae growth may vary spatially (eg, estuaries versus upland rivers) and temporally (ie, seasonally). Where there is a key indication of a single, limiting nutrient (eg P), it would be sensible to focus on managing that nutrient without neglecting controls on other macro nutrients, (eg N)". I obviously concur with this recommendation from (Wilcock et al. 2007), as I was a co-author of the report, that both N and P need to be managed.

...

Many of the scientists now advocating the one nutrient approach for the Hawke's Bay Regional Council (Wilcock, Hickey, Ausseil) were the same ones that had previously advised that the best approach for nutrient management in New Zealand's fresh water is to manage both N and P."

Like Dr Death, the Board found the change in position by these experts difficult to understand. We were not persuaded that it could be explained on the basis that the Tukituki catchment involved different considerations.

Summary of the Board's findings on single versus dual nutrient control

[345] All the expert witnesses seem to be in agreement that a single nutrient approach is fraught with risk. Compelling expert evidence in favour of a dual nutrient approach was provided by Dr Death, Dr Abell and Ms McArthur. And the Board is of the view that the 'hands off' approach to the control of nitrogen currently proposed in PC6 would not give effect to the NPSFM, particularly the policy of avoiding over-allocation.

[346] Under those circumstances the Board has concluded that the 'single nutrient' management approach in PC6, managing nitrogen for toxicity effects only, would be unsustainable. A 'dual nutrient' management approach addressing both phosphorus and nitrogen management would be required.

Managing nitrogen

[347] The chemistry behind nitrogen and its interaction with land use and water quality is complex.

[348] Nitrogen occurs naturally in the environment and approximately 78% of the earth's atmosphere is made up of this gas. Nitrogen gas (N₂) is not readily available to plants and animals directly from the atmosphere.

[349] Despite this, nitrogen or more particularly nitrate, is an essential part of any ecosystem. It forms part of the intracellular makeup of plants and animals and is a vital element for plant growth. To be used by plants atmospheric nitrogen must be 'fixed' by bacteria and absorbed through their roots. Most nitrogen obtained by terrestrial animals can be traced back to the eating of plants. This is all part of the 'nitrogen cycle'.

[350] Because nitrate is extremely soluble in water it is very susceptible to leaching (loss from the soil structure due to rain or irrigation). The rate at which nutrients are leached from soil to groundwater depends on the type of soil, the nature of the crop planted (including pasture), the manner in which the crop is planted, the rate and type of fertilisers applied, and other farm management practices. The Board received evidence indicating that by far the highest proportion of nitrate-nitrogen in the soil comes from the urine patches of livestock.¹⁶⁷

[351] When nitrate-nitrogen leaves the root zone, nitrogen and ammonia (NH₄) are mineralised within the soil structure to produce nitrate (NO₃). Being water soluble it can lead to elevated concentrations of nitrates within groundwater systems.

[352] In the case of the Ruataniwha aquifer the interlinked nature of groundwater and surface water means that surface water can receive nitrates when groundwater flows back into surface water through upwelling and springs. In this way nitrate levels within surface water can reflect past land use activities.

[353] Due to the complex nature of the chemistry involving nitrogen and the fact that it can quite readily move from one oxidised state to another (ammonia (NH₄) to nitrite (NO₂) to nitrate (NO₃)), the various oxidised states are often measured together as dissolved inorganic nitrogen or DIN (DIN = Nitrate + Nitrite + Ammonia).

[354] Once nutrients are lost from the root zone they are no longer available to plants and pasture. For the land owner the leaching of nitrogen can represent not only a loss of nutrients from the farm, but also a loss of production which might impact in monetary terms. Thus the challenge is to maximise the utilisation of nitrogen by plants and

¹⁶⁷ A Mackay, Evidence in Chief, paragraph 15.

pasture and minimise the rate of leaching from the root zone. Obviously this requires careful farm management practices relating to such things as the application of fertiliser, irrigation rates, stocking rates, and plant/pasture management.

[355] Another feature that needs to be taken into account when managing nitrate-nitrogen is the considerable period that can elapse between the loss of nitrate from the root zone at any given farm and its eventual reappearance in surface water. Dr Baalousha estimated that these time lags can be anywhere between 10 years and 100 years, and in some locations more than 200 years.¹⁶⁸ Consequently identification of the cause and effect relationship between elevated nitrate-nitrogen levels in surface water and the land use activity that is responsible can be very difficult, if not impossible.

[356] Now we apply these background features to PC6.

[357] PC6 delivers its regime for the management of nitrate-nitrogen primarily through POL TT4. This policy seeks to introduce a regime, that would ensure the limits specified in PC6 are not exceeded. This regime includes nutrient record keeping and nutrient budgeting using Overseer, a nutrient budget model that calculates and estimates the nutrient flows in a productive farming system for all farm properties greater than 4 hectares (except for those properties of up to 10 hectares that meet the definition of a low intensity farming system).

[358] The policy includes the development of “industry good practice leaching rates” in the primary industry sector and in the RRMP by way of a future plan change by 31 May 2018.¹⁶⁹ Where the Table 5.9.1B (surface water) and Table 5.9.2 (groundwater) nitrate-nitrogen targets are exceeded or become exceeded after 1 July 2018 a land use consent will have to be obtained.¹⁷⁰

[359] A point of some contention was the use of a ‘grandparenting’ approach to leaching rates based on existing leaching rates. “More than minor increases” in leaching rate would trigger the need to obtain a land use consent.

¹⁶⁸ H Baalousha, Tukituki Catchment Proposal Hearing Transcript, page Transcript pages 277 and 299.

¹⁶⁹ Policy TT4 (1)(c)(i) as in Exhibit 90 - Plan Change 6, 19 January 2014.

¹⁷⁰ Policy TT4 (1) (d) as in Exhibit 90 - Plan Change 6, 19 January 2014.

[360] What was considered to be a more than minor increase in leaching was defined by POL TT4(1)(f) as a 10% or more increase for dairy farms and commercial vegetable crops; and a 30% increase for sheep and beef farms, arable farming and cropping, mixed arable/livestock farms (including farms which winter dairy cows or graze young dairy stock), permanent horticultural crops or forestry.¹⁷¹

[361] The difficulty with this approach is that it sets a catchment wide minimum leaching rate of 15kg/ha/yr, plus an increase of up to 30% (that is 19.5kg/ha/yr) and a maximum leaching rate based on existing (potentially excessive) leaching rates plus up to 30% before the need for consent is triggered. Such an approach rewards existing high leaching operations or poor performing operations.

[362] POL TT4(1)(g) introduced the need to prepare a Farm Environmental Management Plan (FEMP; in accordance with schedule XXII) but only if the need to obtain a resource consent was triggered.

[363] In summary, POL TT4 proceeds on the basis that the catchment is generally in a state of under-allocation with respect to instream nitrate-nitrogen. Farming records are to be kept so that Nutrient Budgets can be calculated. Industry good practice nitrogen leaching rates are to be developed, and a plan change incorporating the industry good practice nitrogen leaching rates is to be implemented by 2018. Where the use of production land results in exceedances of the surface water and groundwater nitrate-nitrogen targets a land use consent is required.

[364] Several features of POL TT4 require comment.

[365] First, while POL TT4(1)(a) requires farmers to keep specified records, the process is effectively one of self-management (unless HBRC undertakes an audit of this data). The Board considers that a more robust approach is required. A FEMP, which includes a Nutrient Budget, should be a mandatory requirement for all properties over 4ha (unless they qualify as a low intensity farming system in which case the threshold would be 10ha). The information for any farm or farming enterprise and the complexity

¹⁷¹ Policy TT4 (1)(f) as in Exhibit 90 - Plan Change 6, 19 January 2014.

of a property's FEMP should be in proportion to the complexity or intensity of the particular farming operation. The Board sees this as a necessary step beyond the regime proposed currently. All that is required is the conversion of the information into a cohesive and meaningful management plan.

[366] Secondly there is an apparent disconnect between the proposed provisions of POL TT4 and the conditions for permitted activities in Rule TT1. In order for any farm property exceeding 4ha to be a permitted activity under that rule it must not only have records, but the records have to be used to prepare a Nutrient Budget, a Phosphorus Management Plan (PMP) (for many properties), stock exclusion requirements, and other aspects that might be expected to be in an FEMP.

[367] Thirdly, as it stands POL TT4(1)(b) requires industry good practices to be implemented "on farm properties or farming enterprises" in order to minimise nitrogen losses. This reflects that the aspirations of primary industry in minimising environmental impacts/maximising production are in concert with the environmental desire to minimise the loss of nutrients. Subject to the qualifications that the Board is about to mention, it supports that aspect of the policy.

[368] The first qualification arises from the ability to apply the nitrogen regime to a 'farming enterprise' as that definition now stands. Hamish Peacock, an Environmental Planner called by Horticulture NZ and others gave evidence in support of expanding the application of POL TT4 to 'operations' to recognise the fact that growers activities are more complex than just properties exceeding 4ha.¹⁷² This point was accepted by Mr Van Voorthuysen who proposed the inclusion of a new definition. PC6 now includes the following definition of 'farming enterprise':

"Means an aggregation of parcels of land held in a single or multiple ownership (whether or not held in common ownership) that constitutes a single operating unit for the purpose of nutrient management."

Under this definition all the parcels of land forming part of a farming enterprise do not have to be within the same water management zone of the Tukituki catchment or even within the catchment.

¹⁷² H Peacock, Evidence in Chief, paragraph 2.27.

[369] Some properties within a farming enterprise may harvest fodder crops such as hay and silage on one property for use on another property. The adverse environmental effect of these ‘nutrient transfers’ is likely to occur on the farm where the animals eat the crop and excrete or urinate on the land. Where the two farms are in different catchments there is no logical basis for combining the nutrient budgeting, at least from a leachate point of view. Further, the Board considers that the definition of farming enterprise needs to be limited to those properties that are truly operating as a single farming enterprise. For these reasons the Board considers that the definition of ‘farming enterprise’ goes too far and needs to be amended to ensure that all components of the farming enterprise are operated as one and are at least within the same Water Allocation Zone (WAZ).¹⁷³ We have amended the definition accordingly.

[370] Before leaving this topic we should acknowledge that Fish and Game and EDS contended that nutrient management should proceed on a sub-catchment basis.¹⁷⁴ While this may be ideal in a perfect world, the Board is conscious of the practical difficulties of achieving this in the Tukituki catchment and believes that these difficulties cannot be overstated. The Board has therefore concluded that such a requirement would be too onerous.

[371] Fourthly, there is the requirement in POL TT4(1)(b) to adopt “industry good practice”. Some submitters contended that this provision has no utility and should be removed.

[372] While it is hoped that all farmers will adopt the best practice available within the industry for their particular farm property, this might not always be the case. An example is provided by the Dairy Industry Accord. When questioned by the Board about whether the Dairy Accord had ever resulted in Fonterra refusing to pick up a dairy farm’s milk, it was indicated that there had been at least one occasion when that had happened.¹⁷⁵ However, after further investigation the Board was advised by counsel that this refusal to pick up milk was due to a contamination issue with the milk rather than a direct breach of the environmental standards in the Dairy Accord. This serves to

¹⁷³ Zones are shown in Figure 4 at paragraph [153] above.

¹⁷⁴ H Marr, Evidence in Chief, from paragraph 195 and K McArthur, Evidence in Chief, paragraphs 12, 15, 22 and 32.

¹⁷⁵ Tukituki Catchment Proposal Hearing Transcript, page Transcript at page 1166.

highlight potential difficulties with a regulatory regime founded on voluntary compliance with industry good practice.

[373] The efficacy of the phrase “reasonably practicable farm management practices” was traversed by the Environment Court in *Day v Manawatu-Wanganui Regional Council*¹⁷⁶. Several difficulties were identified, including: “the likelihood that farmers would argue that any measure that involved increased costs was not practicable; it was not possible to say that implementation of reasonably practicable farm management practices would reduce nitrogen leaching; even if it did, it was not possible to quantify the reduction in nitrogen leaching that was attributable to best farm practices; and it was not possible to define what the ‘best farm management practices’ would be on one farm compared with another.”¹⁷⁷ The Court decided that the phrase should not appear in the surface water quality objectives, policies, or rules of the One Plan.

[374] The Board acknowledges the concerns expressed in *Day* and agrees that regulation requiring industry good practices determined by the industry itself cannot form part of an enforceable regulatory approach. Nevertheless the Board supports the philosophy underlying POL TT4(1)(b) which is that all farms should strive to adopt the best farming practices that are available for that property. Put another way it is an *aspirational* policy and in that sense it provides a useful consideration when it comes to formulating FEMPs, which the Board sees as a cornerstone of nutrient management. Therefore we consider that POL TT4(1)(b) should be retained.

[375] Fifthly, POL TT4(1)(c) proceeds on the basis that the Tukituki River catchment is generally in a state of ‘under-allocation’ with respect to instream nitrate-nitrogen limits and maximum catchment load. The Board has already made the point that whether or not the catchment is over-allocated or under-allocated depends on the levels that are set in Tables 5.9.1B and 5.9.1D. We have concluded that the levels set in Table 5.9.1B are not appropriate and need to be altered by the addition of a DIN limit for all of the water management zones, not just Zone 4. The levels that we set will significantly alter the underlying premise that the catchment is ‘under-allocated’ in relation to instream nitrate-nitrogen. Parts of the catchment will be ‘over-allocated’.

¹⁷⁶ *Day v Manawatu-Wanganui Regional Council* [2012] NZEnvC Wgtn, 182 (5–181),

¹⁷⁷ At page 5–62.

[376] While on this topic the Board notes that the effect of POL TT4(1)(h) and Table 5.9.1D as they stand is to increase the maximum allowable nitrogen load above Black Bridge to 5059 tonnes/year. This parameter was included by HBRC following the conferencing of planners in January 2014¹⁷⁸ with a view to providing a further parameter concerning nitrogen. Judging from the information attached to the joint conferencing report, this tonnage represents a 70% increase above the calculated current nitrogen load in the catchment of 2970 tonnes/year.¹⁷⁹

[377] Given that this nitrogen load covers the *whole* of the catchment it cannot provide any useful information about particular land uses that might be responsible for the catchment load. Consequently it would be of little assistance from a regulatory point of view. At best it might provide a ‘red flag’. But the Board is satisfied that the approach to (DIN) that it intends to adopt will provide useful information. Equally importantly, it is difficult to see how the message that is inherent in the large increase in the catchment load of 5059 tonnes, could give effect to the NPSFM. For those reasons the Board has therefore decided to delete Table 5.9.1D and the reference to it in POL TT4(1)(h).

[378] Finally, POL TT4(1)(c)(i) provides for the primary industry sector to develop industry good practice nitrogen leaching rates by 1 July 2017. However, this highlights the difficulty expressed by the Environment Court in *Day* of leaving an essential part of a policy to be determined in the future. In the Board’s view nitrogen leaching rates and instream limits should be set now, especially given the wealth of information that has been provided during the course of this inquiry.

Setting nitrogen leaching rates

[379] Fish and Game¹⁸⁰ and some other submitters sought an allocation mechanism related either to a flat rate per hectare within the catchment or alternatively a land use capability (LUC) approach based on the productive capability and characteristics of the land itself. The LUC classification system provides a nationwide systematic arrangement of different kinds of land according to their capacity for long term

¹⁷⁸ Expert Conferencing Joint Witness Statement to the Board of Inquiry - Planners (Change 6), 22 October 2013.

¹⁷⁹ Expert Conferencing Joint Witness Statement to the Board of Inquiry –Planners (Change 6) second statement, 10 January 2014, table 2 of Attachment 3.

¹⁸⁰ Fish and Game Legal Submissions, page 19 and H Marr, Evidence in Chief, paragraph 184 et seq and A Rhodes, Evidence in Chief, paragraph 5.21.

sustained production.¹⁸¹ When giving evidence for Fish and Game, Anthony Rhodes, an Agricultural Consultant, supported the use of LUC classification for assessing nitrate-nitrogen leaching rates.¹⁸²

[380] Further support came from Garth Eyles, a submitter with extensive experience in the use of LUC assessments at a national and regional level. His conclusion was:

“Comprehensive farm plans need to be the basic planning unit from which nutrient management plans can be interpreted. The comprehensive plans need to be based on the traditional LUC assessment approach as described in the Land Use Capability Survey Handbook (Lynn et al. 2009).”¹⁸³

We accept this evidence. As we have already said, the Board considers the the preparation of FEMPs for all properties is pivotal to the sustainable management of land use and water quality in the Tukituki Catchment.

[381] Use of an LUC approach for the Tukituki catchment was considered in a 2012 report Nutrient Management Approaches for the Tukituki Catchment.¹⁸⁴ After considering and discarding a ‘grandparenting’ regime (effectively locking in existing farm nutrient leaching rates) and an ‘averaging’ approach (whereby every hectare of land in the catchment receives the same nitrogen leaching allowance), the report continued¹⁸⁵:

“... the remaining option centres on what has been called the “natural capital” approach. This sees allowable leaching rates varying spatially across a catchment (or across the five delineated water management zones in the case of the Tukituki Catchment) with the spatial variation being linked to the underlying land use capability (LUC). This approach was initially developed by Dr Mackay for the Manawatu-Wanganui Regional Council and that Council uses it for new intensive farming enterprises (which in their case was solely dairy farming).”

181 Lynn, I.H et al, 2009 Land Use Capability Survey Handbook — A New Zealand Handbook for the classification of land 3rd edition.

182 A Rhodes, Tukituki hearing transcript at page 2517.

183 G Eyles, Evidence in Chief, page 16.

184 M Benson, L Coubrough, I Millner and R van Voorthuysen, Nutrient Management Approaches for the Tukituki Catchment, 30 August 2012, ‘Folder 5 of Plan Change application documents, Tab 2.

185 M Benson, L Coubrough, I Millner and R van Voorthuysen, Nutrient Management Approaches for the Tukituki Catchment, 30 August 2012, ‘Folder 5 of Plan Change application documents, Tab 2, page 20.

We pause at this point to note that this report was obviously written prior to the Environment Court’s decision in *Day*¹⁸⁶ which overturned the Hearing Panel’s ruling and extended the LUC approach in the Manawatu-Wanganui region to all kinds of intensive farming including existing farming operations.

[382] Returning to the Nutrient Management Approaches for the Tukituki Catchment Report:

“HBRC has undertaken further work to determine the LUC based natural capital leaching rates for the Tukituki catchment. These are set out in Table 2 below.

Table 2: Tukituki LUC Natural Capital Nitrogen Leaching Rates

LUC Class	I	II	III	IV	V	VI	VII	VIII
Rate (kgN/ha/year)	30.1	27.1	24.8	20.7	20	17	11.6	3

In the Tukituki context these “natural capital” leaching rates can be used to determine the relative differences between allowable leaching rates for different LUC land classes.”

The leaching rates in the above table are the same as proposed by Fish and Game via the evidence of Dr Rhodes.¹⁸⁷ The Board has adopted these LUC leaching rates which have been incorporated in Table 5.9.1D.

[383] These rates are also comparable with (but not identical to) the leaching rates approved for Manawatu-Wanganui by the Environment Court in *Day*. While it is not determinative, the Board notes that s 66(2) of the RMA requires it to consider the extent to which a regional plan needs to be consistent with the plans of adjacent Regional Councils. A LUC approach for the Tukituki catchment would be consistent with the approach in the One Plan.

[384] After discarding ‘grandparenting’ and ‘averaging’ approaches, the Nutrient Management Approaches for the Tukituki Catchment Report also rejected a LUC

¹⁸⁶ *Day v Manawatu–Wanganui Regional Council* [2012] NZEnvC Wgtn (182 5–71).

¹⁸⁷ A Rhodes, Evidence in Chief, paragraph 5,21.

approach on the basis that it would increase the maximum allowable zone load above what is currently leached. Ironically, as we have already noted PC6 as currently proposed would actually allow a significant increase in nitrogen leaching.

[385] The extent of that increase can be compared with the increase that would arise if a LUC approach was adopted. If it is assumed that all of the 25,000ha proposed to be irrigated by the RWSS falls evenly within LUC classes 1, 2 and 3, the total nitrogen leaching from those three categories of land, including current pre-irrigation leaching, would only be 683 tonnes of nitrogen per year. That can be compared with the 1,950 tonne/year catchment load increase proposed by HBRC.

[386] Ian Millner, Senior Land Management Advisor with HBRC, dismisses the use of LUC on the basis that it does not directly correlate to nutrient loss or the PMPs and FEMPs proposed in PC6.¹⁸⁸ However, rather than providing a reason why LUC should not be used, this simply reflects that LUC was not used as the basis for those PC6 derived plans. Mr Millner also contends¹⁸⁹ that application of LUC rates would result in an increase in total catchment leaching. Of course this assumes that *all* farms within the catchment will somehow increase inputs and stocking rates regardless of the availability of water.

[387] The Board has difficulty with that assumption. Outside the areas to be irrigated the majority of the farmers in the catchment will already be maximising non-intensive production. In the absence of a secure water supply it would probably be difficult for stocking rates or intensification to be lifted to any significant extent. Thus higher leaching rates for those parts of the catchment are unlikely to have any environmental effect, and we do not find Mr Millner's explanation for declining to adopt LUC based leaching rates compelling.

The Board's conclusions as to the management of nitrogen

[388] Effective nitrogen management requires a two-pronged approach. The first component involves the setting of *on-land* root zone leaching limits which will serve as

¹⁸⁸ I Millner, Evidence in Chief, paragraph 3.34.

¹⁸⁹ I Millner, Evidence in Chief, paragraph 5.18 et seq.

an important control at the source of the leaching process (the fence at the top of the cliff). The other component involves the setting of *instream* nitrate-nitrogen and DIN limits which will serve as a check as to the effectiveness of the LUC leaching rate control.

[389] Each of these mechanisms need some further explanation.

[390] As to the setting of limits for root zone leaching, there is a broad consensus between the Fish and Game experts, part of the reasoning in the earlier HBRC study, and the approach in *Day*, that the LUC method is the most appropriate vehicle for setting of leaching rates. Having weighed all the evidence the Board is satisfied that this method is appropriate for the Tukituki catchment. The relevant rates are set out in Table 2 of the Nutrient Management Approaches for the Tukituki Catchment Report¹⁹⁰ and these will be incorporated into PC6.

[391] All this reflects that there are distinct advantages in using the well-established LUC system. It takes into account the particular characteristics of the various land use classes in terms of contour, soil type, and other physical characteristics. It is relatively simple and easy to follow. And it has an inherent logic because it is based on the actual natural capital of the soils which reflects the uses that are likely to be made of the land in the future.

[392] Equally importantly LUC leaching rates eliminate the need for the current ‘grandparenting’ regime in POL TT4(1)(e) and (f) which is based on percentage increases in leaching rates. As noted in the Nutrient Management Approaches for the Tukituki Catchment Report,¹⁹¹ such an approach could reward existing high leaching land users. It also lacks any incentive to improve land use practises so that leaching is reduced. As the Board sees it, those features are the opposite of what POL TT4 is seeking to achieve and are thoroughly incompatible with the NPSFM.

¹⁹⁰ M Benson, L Coubrough, I Millner and R van Voorthuysen, Nutrient Management Approaches for the Tukituki Catchment, 30 August 2012, ‘Folder 5 of Plan Change application documents, Tab 2, Table 2.

¹⁹¹ M Benson, L Coubrough, I Millner and R van Voorthuysen, Nutrient Management Approaches for the Tukituki Catchment, 30 August 2012, ‘Folder 5 of Plan Change application documents, Tab 2, page 19.

[393] By itself the setting of leaching rates based on the LUC capacity of the soils will not achieve the desired outcome which is to ensure compliance. The Board accepts that Mr Eyles is right when he suggests that there should be a FEMP for *all* farms greater than 4ha (or 10ha in the case of low intensity use), with those plans having to address the management of nitrogen (and phosphorus). The Board appreciates that such a regime will involve a cost to farmers. Nonetheless, the Board has concluded that the time has been reached where that cost will have to be met if serious efforts are to be made to avoid further degradation and restore the Tukituki waterways to health.

[394] Turning to the instream regime, we have already concluded that nitrate-nitrogen limits based on *toxicity* are not satisfactory and that the levels should be set to protect *ecological health*.

[395] Led by Fish and Game and EDS, many submitters sought the instream DIN limit of 0.444mg/l advanced by Ms McArthur and others.¹⁹² This figure comes from the 2000 Australian and New Zealand Environment and Conservation Council (ANZECC) Australian and New Zealand Guidelines for Fresh and Marine Water Quality guidelines (commonly known as the ANZECC guidelines) and is a default trigger value for physical and chemical stressors for slightly disturbed ecosystems.¹⁹³ While this figure suggests a high level of accuracy, the reality is that the 3 decimal places arise from averaging a wide selection of New Zealand rivers (excluding the Haast River due to that river receiving water from predominantly alpine areas).

[396] The Board is aware that this limit has been used in other regional plans but, as far as we are aware, there has been no detailed analysis supporting that limit.

[397] No witness was able to point to a truly scientific basis for the 0.444mg/l limit. We are also conscious that when advancing this DIN limit, counsel for Fish and Game proposed an implementation date of 2050:

¹⁹² McArthur evidence in chief at para 93

¹⁹³ Australian and New Zealand Guidelines for Fresh and Marine Water Quality guidelines 2000, table 3.3.10, page 33-17.

“ ... to provide plenty of time for technology improvements, including with respect to technology, to reduce nitrogen leaching and modelling that can accurately estimate instream nitrogen concentrations.”¹⁹⁴

By suggesting a timeframe so far out, Fish and Game seems to be acknowledging that the 0.444mg/l target is overly optimistic, at least at this stage of technological knowledge. That is certainly the Board’s view.

[398] When it comes to setting a DIN level we have found Dr Death’s evidence very helpful. He suggested a two step approach, with the first step being to identify instream values. Having established those values limits can then be set. Dr Death told us:¹⁹⁵

“If the Plan objective is to ‘maintain or enhance habitat and health of macroinvertebrates, native fish and trout’ and ‘fewer occurrences of excessive periphyton growths that adversely affect recreational use and amenity’ then the limits for DIN need to be somewhere between 0.085 and 0.8mg/l.”

Of course the objectives posed by Dr Death come from OBJ TT1(a) and (c). In broad terms they equate with the ‘ecological health’ approach that Dr Death discussed and which we support.

[399] After a good deal of consideration the Board has decided that a DIN limit of 0.8mg/l should be set for Water Management Zones 1, 2, 3, and 5. As we have said earlier the Board sees this as a pragmatic limit that balances ecological health with the desire for more intensive land use. Apart from that it promotes the sustainable management of natural and physical resources and gives effect to the NPSFM.

[400] In arriving at that limit we note that the current DIN level at Red Bridge is 0.751mg/l, with some other locations in the catchment being higher and others lower.¹⁹⁶ This indicates to us that a DIN limit of 0.8mg/l is not out of touch with reality.

[401] Obviously we have strived to arrive at a limit that will achieve environmental values without putting farmers, orchardists or horticulturalists out of business. The limits we have adopted will allow high performance farmers to intensify by

¹⁹⁴ Fish and Game, Opening Legal submissions, paragraph 11.7.

¹⁹⁵ R Death, Evidence in Chief, paragraph 7.21.

¹⁹⁶ R Wilcock, Evidence in Chief, exhibit RJW5.

implementing some or all of the advanced management strategies identified by Andrew Macfarlane of Macfarlane Rural Business (MRB) and Dr Alison Dewes who gave evidence on behalf of Fish and Game. It also recognises that as a discharger of nutrients and contaminants, the primary sector is no different from any other industry. It has the same obligations to operate within limits and internalise effects, or mitigate those effects where absolute internalisation is not possible. We will come back to that matter when considering economic issues.

[402] At a maximum concentration of 0.8mg/l DIN in the river at Red Bridge with a mean flow of 143m³/s the total discharge of DIN will be 3607 tonnes per year. The current concentration of DIN in the river at Red Bridge is 0.751mg/l and this concentration results in a total discharge of DIN of 3386 tonnes per year. This demonstrates that on a catchment load basis there is limited 'headroom' for further nitrogen leaching and steps are required to address those upstream nitrogen 'hotspots' that are evident in Exhibit RJW5 to Dr Wilcock's evidence in chief.

[403] There was a suggestion that different limits should apply to tributaries and the mainstems of rivers. The Board has concluded that it is important to keep PC6 as simple as possible and we cannot see any benefit in attempting to set different levels for tributaries. The exception is Zone 4 which is effectively pristine water derived from a catchment that is largely conservation land. There was agreement between the experts about this limit and the Board does not see any reason to alter it.

[404] During the hearing there was debate about whether it was necessary to have both nitrate-nitrogen limits and DIN limits. Views were divided. After due consideration the Board decided that it is desirable to set limits for both parameters, with the DIN limits effectively setting the threshold. PC6 will therefore be amended to include both DIN and nitrate-nitrogen limits.

Phosphorus management

[405] Whereas nitrogen leaches through the soil to the water, phosphorus tends to attach to soil particles and to travel over land to water. Dr Richard McDowell an

AgResearch Ltd Senior Freshwater Scientist, gave evidence¹⁹⁷ for HBRC detailing how phosphorus losses are measured in dissolved and particulate forms. Dissolved phosphorus consists of inorganic phosphorus (also termed dissolve reactive phosphorus; DRP) which is readily available for uptake by algae, and organic phosphorus, which is less available to algae. Both dissolved inorganic and organic phosphorus can be sorbed onto soil and then lost from the landscape and transported to waterways as particulate phosphorus (particulate P).

[406] Phosphorus in particulate form must be released through enzymatic or physicochemical processes before it becomes available to plants and algae. Hence, in terms of excessive algal growth, DRP is of most concern in fast-flowing streams and rivers (unless there is sufficient interaction between particulate-P (in sediments) and overlying water to achieve desorption of phosphorus controls in-stream DRP concentrations).

[407] The extent of the interaction between instream concentrations of phosphorus and phosphorus held in stream sediments was the subject of some discussion. Most phosphorus loss to surface waterways originates as diffuse sources from agricultural production systems, together with point source inputs associated with treated industrial or domestic wastewater discharges. Sources of Phosphorus loss from agricultural systems includes (but are not limited to) soil losses; the application of phosphorus-fertilisers; manure or dairy shed effluent; the treading of grazing animals causing erosion of topsoil (or stream bank destabilisation); dung deposition; losses from infrastructure such as farm tracks and lanes; cultivation of land; and decomposing (or poorly utilised) plant residues.¹⁹⁸

[408] The Board received evidence that of the 22 sites monitored for phosphorus, only 3 sites are currently below the DRP limit of 0.010ml/l for mainstems in Table 5.9.1B. The percentage reductions of DRP concentrations required to meet the target ranged from 12% to 94%.¹⁹⁹ Those limits and targets are to be met by 1 July 2030.²⁰⁰ This

¹⁹⁷ R McDowell, Evidence in Chief, paragraph 3.1.

¹⁹⁸ R McDowell, Evidence in Chief, paragraph 3.5.

¹⁹⁹ R Wilcock, Evidence in Chief, exhibit RJW 5.

²⁰⁰ Policy TT1 (1)(b) of Exhibit 90 - Plan Change 6, 19 January 2014.

highlights the extent of over-allocation in some areas and the need for considerable work to be done to address phosphorus losses in the Tukituki catchment.

[409] Dr McDowell focused on the diffuse sources of phosphorus. He considered that a range of options were available to match a mitigation strategy to the processes of phosphorus mobilisation and loss pathways²⁰¹. These were referred to as the “critical source areas” or CSAs. Dr McDowell considered that mitigation of phosphorus losses requires a good understanding of the sources and transport mechanisms involved in order to match the appropriate farm management and mitigation measures at farm scale.²⁰²

[410] The need to identify phosphorus losses and appropriate mechanisms for mitigating critical sources and pathways of those losses at a farm by farm scale is reflected in the PC6 requirement for properties in some sub-catchments or having certain topography or stocking levels to prepare a PMP for each farm property or farming enterprise as defined by PC6.

[411] POL TT5 explains how the phosphorus limits and targets will be implemented. The underlying intent of POL TT5 is to reduce phosphorus losses through better farm management practices, the use of PMPs, and the control of point source discharges.

[412] Policy TT5(1)(d) recognises that the middle and lower Tukituki River catchment is “generally in a state of over allocation with respect to instream phosphorus limits”²⁰³. Contrary to the belief of some submitters there is no intention to allow an increase in phosphorus levels.²⁰⁴

[413] At the conferencing of experts on the topics of water quality and land use, it was agreed that the DRP concentration limits in Table 5.9.1B, expressed as an annual concentration at river flows below three times the median flow, are adequate²⁰⁵. It was

²⁰¹ R McDowell evidence in Chief paragraph 3.1.

²⁰² R McDowell evidence in Chief paragraph 3.15.

²⁰³ Exhibit 90

²⁰⁴ R van Voorthuysen, Evidence in Chief, paragraph 14.1.

²⁰⁵ Additional Expert Conferencing Joint Witness Statement to the Board of Inquiry – from O Ausseil, K McArthur and A Uytendaal on change 6 Water quality limits, 4 November 2013, paragraph 1.

also agreed that the methods of assessing compliance in PC6 are appropriate.²⁰⁶ The Board agrees, but considers that PC6 should require *all* properties within the catchment exceeding 4ha (or 10ha for low intensity use) to have a PMP identifying any critical source areas or pathways for phosphorus losses as part of its FEMP. Again, the complexity of this component of the FEMP would reflect intensity of the farming system and/or the extent to which phosphorus loss is an issue for that particular property.

[414] Subject to the qualification that all properties should have a PMP, the Board accepts that the provisions in PC6 concerning the management of phosphorus are appropriate and will give effect to the NPSFM. They will also promote sustainable management within the catchment.

[415] While on the subject of phosphorus we should mention that Stephen Thrush, the Technical Services Manager for CHBDC, gave evidence detailing the steps recently taken by the CHBDC to better treat the wastewater streams within its district, particularly from Waipukurau and Waipawa. We were told that the \$6.1m cost of new treatment plants is borne by a total ratepayer base in those townships of 3,447 people.

[416] The Board accepts that CHBDC and its urban ratepayers are committed to improving water quality in the Tukituki River. To reflect this, POL TT3A (which provides for existing community waste water discharges to adopt the ‘best practicable treatment option over time’) was introduced during the inquiry process, with the support of all the planners²⁰⁷. It can be anticipated that with the new treatment plants the quality of the Tukituki and Waipawa Rivers below these discharges will improve significantly. Little issue was taken with POL TT3A, and it gives effect to the NPSFM which lists the “cleaning, dilution and disposal of waste” as a use for which freshwater is valued.²⁰⁸

[417] The commitment of CHBDC to addressing the municipal point source discharges of phosphorus should not be seen as providing an opportunity or ‘headroom’ for further increases in diffuse discharges from sources such as agriculture. To the

²⁰⁶ Additional Expert Conferencing Joint Witness Statement to the Board of Inquiry – from O Ausseil, K McArthur and A Uytendaal on change 6 Water quality limits, 4 November 2013, paragraph 2.

²⁰⁷ Expert Conferencing Joint Witness Statement to the Board of Inquiry - Planners (Change 6), 22 October 2013.

²⁰⁸ National Policy Statement for Freshwater Management, 2011, Preamble, page 2.

contrary all farm properties must prepare a PMP as part of its FEMP so that the escape of phosphorus can be minimised as far as possible.

Modelling of nutrient losses

[418] The Board's approach to PC6 introduces the need for all farms within the Tukituki catchment to play a role in the management of nitrogen and phosphorus in order to meet the surface water quality limits specified in Table 5.9.1B (as amended by the Board) and the groundwater quality limits in Table 5.9.2 of PC6.

[419] Nutrient Budgets are required for all properties with nutrient losses modelled using Overseer. Some submitters questioned the use and validity of Overseer given the acknowledged +/- 30% prediction error associated with the various versions of the model.²⁰⁹ However, Overseer was acknowledged by all of the experts in the farm management field to be the best tool currently available to predict nutrient losses at the farm scale level²¹⁰ (particularly where the model is applied using the same parameters applied to pre and post intensification scenarios to obtain a relative change position).

[420] Notwithstanding this apparent consensus, it was acknowledged that while Overseer can be used to assess average phosphorus losses at a farm scale, the model does not identify CSAs for phosphorus loss. Nor does it contain a full suite of mitigation strategies²¹¹ that could produce more accurate modelling. When giving evidence Dr McDowell told us that a new model known as the MitAgator software programme is currently under development and validation. When that process is completed the programme will assist in the identification of CSAs for phosphorus.

[421] In the meantime the identification of CSAs and the targeting of strategies to mitigate losses need to be undertaken as part of an on farm PMP. It is therefore important to understand the matters that need to be addressed in such a plan.

²⁰⁹ D Wheeler, Evidence in Chief, paragraph 11.6.

²¹⁰ Expert Conferencing Joint Witness Statement to the Board of Inquiry – Land and Water Quality Conferencing, 21 Oct 2013, paragraph 1.

²¹¹ R McDowell, Evidence in Chief, paragraph 2.6.

[422] When PC6 was notified the definition of ‘PMP’ was relatively brief and lacked detail. During the inquiry process it was expanded so that it now reads²¹²:

“Phosphorus Management Plan (PMP)

Means a plan prepared generally in accordance with industry code of practices which identifies the inherent environmental risks on the farm property or farming enterprise associated with phosphorus and sediment loss, the significance of those risks, and identifies management practices to be implemented to avoid or reduce the risks. In particular a PMP shall:

- a. Aim to maintain or reduce phosphorus loss from the farm property;
- b. Include a nutrient budget;
- c. Identify critical source areas for phosphorus loss on a farm map;
- d. Evaluate, using appropriate techniques, a range of farm specific phosphorus loss mitigation measures including, but not limited to:
 - (i) achieving optimum Olsen P levels in the soil;
 - (ii) the optimal use of phosphorus fertilisers;
 - (iii) sealing effluent ponds, practicing deferred irrigation of effluent and avoiding overland flows of effluent;
 - (iv) stock exclusion from water bodies;
 - (v) avoiding intensive animal feeding operations and the grazing of forage crops on shallow soils underlain by shingle or sand;
 - (vi) the mitigation measures listed in POL TT5(1)(e)(iii) to (v).
- e. Include a time bound implementation plan that outlines which mitigation methods are to be used to maintain or reduce phosphorus loss from the farm property;
- f. Be certified as being technically appropriate by an approved person who is a Certified Nutrient Management Advisor or who has completed both the “Intermediate” and the “Advanced” courses in “Sustainable Nutrient Management in New Zealand Agriculture” conducted by Massey University.”

The Board accepts this definition.

[423] Rule TT1(e) provides for a PMP to be progressively implemented in specified sub-catchments between 1 July 2017 and 1 July 2020, and for other properties depending on topography and livestock policies.²¹³

²¹² Exhibit 90 - Plan Change 6, 19 January 2014.

²¹³ Rule TT1(g) effectively provides an alternative to preparation of a PMP for single paddocks on production land which is identified in Schedule XX as having a slope of greater than 15 degrees and where the stocking rate exceeds 18 stock units per ha. The alternative is for all livestock to be excluded from the beds and margins of any lake, wetland and flowing river or for individual farm properties or farm enterprises exceeding 4ha in size located in catchments other than those listed in Rule TT1(e) to prepare a PMP by 31 December 2020.

[424] For *nitrogen*, the output of Overseer is used to determine whether the nitrogen leached from the land (modelled as a loss from the root zone using Overseer or an alternative model approved by HBRC) exceeds industry good practice leaching rates determined in accordance with POL TT4(1)(c).²¹⁴ Overseer records are then used to determine whether nitrogen leached from the land exceeds the benchmark leaching rates determined in accordance with POL TT4(1)(e).

[425] As far as *instream* effects are concerned, one of the requirements for production land use to qualify as a permitted activity (under Rule TT1(k)) is that the nitrogen leached from land does not cause or contribute to any measured exceedance of the surface water or groundwater limits in Table 5.9.1B and Table 5.9.2 respectively. The modelling of this effect for the Tukituki River catchment was conducted by a model known as TRIM 2. That model sought to estimate zone loads, instream nitrogen loads and groundwater loads for all points beyond the root zone area modelled by Overseer.

[426] PC6 as advanced by HBRC proposed to effectively use the TRIM 2 model as a predictive model and a management tool for determining maximum allowable nitrogen zone loads and instream loads, yields and concentrations. There was much criticism of the TRIM 2 model and its ability to replicate observed trends in groundwater and surface water quality. It was contended that the model was not ‘fit for purpose’.

[427] In response to this criticism Dr Rutherford said that whether the TRIM 2 model is ‘fit for purpose’ depends on the purpose or purposes to which it is put.²¹⁵ He explained:²¹⁶

“To date the TRIM model has been used to inform HBRIC about the extent to which the intensification of land use on irrigated land in the Ruataniwha Plains will increase stream nutrient concentrations, increase the risk of Nitrate toxicity and aggravate existing problems of high periphyton biomass in summer.

In this role it can be argued that any risks associated with the model uncertainty are borne by the applicant. It monitors and detects stream concentrations that exceed the limits regardless of what the model predicts, this will trigger remedial action.

...

²¹⁴ Rule TT1(d) of Exhibit 90 - Plan Change 6, 19 January 2014.

²¹⁵ K Rutherford, Rebuttal Evidence - TRIM, paragraph 7.2.

²¹⁶ K Rutherford, Rebuttal Evidence - TRIM, paragraphs 7.4, 7.5 and 7.7.

... It is my understanding that HBRC and/or HBRIC plan to use a combination of routine monitoring, targeted investigations and modelling to ensure that limits are complied with and to determine the causes of any breaches.”

While we agree with the reservations expressed by Dr Death and Dr Gilbert Zemansky (a hydrologist engaged by Fish and Game) ²¹⁷ and others about the ability for TRIM 2 to accurately predict future instream nutrient levels, we also agree with Dr Rutherford that its use is only *part* of the regime proposed by HBRC for its nutrient management.

[428] On the other hand, the Board cannot agree with Dr Rutherford’s proposition that the risk associated with any uncertainty is borne by the applicant (in its capacity as the applicant for the RWSS). We see those risks as being borne by the environment and by all those who enjoy that environment. Moreover, the significant time lags between a particular land use practice and a resulting high nitrogen leaching or nutrient load becoming evident in surface water means that it may be many years before any effect is identified and recorded. In such circumstances any adaptive management approach will have its shortcomings.

[429] Having said that, the approach that we have adopted of determining root zone leaching rates by reference to the LUC method means that the role of the TRIM model in predicting instream nitrogen levels is less important. While it still has a use as a management tool it is of less consequence in terms of the actual regulation of land use. Rather than serving as an enforceable regulatory regime, the instream limits that we have promoted will serve as an indicator as to the success or otherwise of the on-land root zone limits (the ambulance at the bottom of the cliff).

Impact of these policies on farming

[430] Fundamental to the regime required by our decision is the need for Farms and Farming Enterprises to not only gather meaningful information but to use that information as an integral part of the management of the farming operation, by the preparation of a FEMP.

²¹⁷ G Zemansky, Evidence in Chief, paragraph 2.8.

[431] The adoption of LUC leaching rates may require new and innovative technologies and farming methods to be implemented in order to comply with the permitted activity standards (or where that is not possible to obtain consent). The evidence of Mr Macfarlane is that such technologies and systems are already available.²¹⁸ No doubt other technological and management techniques will evolve over the years to come.

[432] It needs to be recognised that some land is simply not suitable for some intensive farming operations. In *Day v Manawatu-Wanganui Regional Council* the Environment Court saw one of the benefits of adopting a LUC approach is that more intensive land use on the higher quality soils will provide more options for production and for mitigating Nitrogen loss²¹⁹. In order to comply with the permitted activity status as proposed by the Board for use of production land all farms over 4ha (or 10ha in the case of low intensity use) will have to keep the records specified in Schedule XXI of PC6 or copies of the Overseer input and output files. An FEMP which must include a Nutrient Budget (as defined) and a PMP (as defined) also must include the matters required by schedule XXII such as stock exclusion from waterways. This approach of requiring FEMPs across the board has the advantage of being relatively straight forward and easy to understand and implement. The Board considers that the approach previously proposed in PC6 is unnecessarily complex and runs the risk of becoming disjointed.

[433] As we have already mentioned the complexity of Nutrient Budgets and PMPs will reflect the intensity of the farming operation or the extent to which phosphorus losses are currently a problem. Given the requirement under PC6 or currently proposed 6 to maintain records, the requirement to take those records a further step to the formulation of a comprehensive management plan should not be too onerous. To the contrary, it is consistent with farming aspirations of maximising output while minimising inputs and losses.

[434] When giving expert evidence in support of the RWSS Mr Macfarlane referred to and defended the assumption that the opportunities afforded by the irrigation scheme would lead to a better ‘standard of management’ or ‘top 20% farmer productivity’.

²¹⁸ A Macfarlane, Evidence in Chief, paragraph 5.16.

²¹⁹ At paragraph 5–112.

There was much discussion about balancing environmental outcomes with intensification of land use.

[435] In this respect we find it significant that Mr Macfarlane was able to identify many examples of how good farm management practices could be incorporated into a farming regime²²⁰. He said:

“The original budgets in the Report incorporate a large number of good management practices (GMP) as being part of an integrated farm management program.

Such practices on, for example, a dairy farm, include:

- Individual paddock testing of soil macronutrients
- soil testing for organic matter content
- preparation of, and adherence to, nutrient budgets
- fenced off/destocked and planted riparian strips
- no fertilizer spread near waterways
- good nitrogen application practices
- accurate placement of effluent at low rates over a large area when soil conditions will absorb the nutrient, and associated good practice in stored effluent volume
- knowledge of soil moisture holding capacity, irrigation depth, deficit irrigation, and soil moisture monitoring
- use of balanced diets (incorporating grain and/or maybe silage to balance diets in order to minimize protein (N) loss from diet)
- the cost of such strategies are either incorporated in farm working expenses (fertilizer, R&M etc) or into initial capital.

In addition to those specific methods, entire systems have been designed around optimising the balance between productivity and environmental outcomes (which are rarely antagonistic).’

²²⁰ A Macfarlane, Evidence in Chief, paragraphs 5.6, 5.7 and 5.8 et seq.

[436] Mr Macfarlane also referred to the advances in technology that aid in the achievement of both environmental and economic outcomes. He mentioned these matters:²²¹

“... ”

- VRI on pivot and lateral irrigators, which I see good potential for on farms with variable soils such as Takapua and Hastings interactions
- telemetry and remote sensing of water flows, drainage, temperature and other data
- GPS aided precision placement of fertilizer on both hill country and irrigated flats
- GPS aided proof of placement technology
- electronic surveillance of cow heat detection and feed levels
- remote tracking of effluent waste disposal
- remote sensing feed recording
- grid testing for phosphorus within paddocks to inform precision placement of fertiliser in order to reduce potential phosphorus loss.

Such technologies are not necessarily expensive, and typically generate better resource use efficiency, which has benefits for profitability, environmental sustainability and animal welfare. Such technology is rapidly moving from proof of concept to economic reality.

Further system type changes are also possible as variations to any of the budgets to suit individual properties or farmers.”

This evidence is broadly consistent with the evidence given by Dr Dewes.

[437] Dr Dewes provided compelling examples of opportunities to use technology and innovative farm management systems to achieve not only land use intensification but also enhanced environmental outcomes. She described this as achieving the “sweet spot” for a farming business, the point at which production is maximised and risks are minimised²²².

²²¹ A Macfarlane, Evidence in Chief, paragraph 5.16, 5.17 and 5.18.

²²² A Dewes, Evidence in Chief, paragraph 148.

[438] We also note that Dr Dewes supported the use of an LUC based approach to nutrient management. She told the Board:²²³

“An LUC regime for allocation of nitrogen loss rights provides three fundamental requirements for business over the ensuing decade. A) Improved certainty for business to operate and plan within (new and established) thereby reducing the risk of stranded capital¹². B) provision of certainty for current farmers, in that the resources and ecosystem services (assimilative capacity of water bodies) that they rely on will be managed through the allocation of pollution rights being linked to the receiving environment and C) that nutrient headroom (if there is any) in the receiving catchment will be allocated in a way that links to the inherent productivity and vulnerabilities associated with the land.”

Again the Board found this to be compelling evidence.

[439] Some submitters²²⁴ expressed concern about the possibility of resource consent being required to farm. We note that similar concerns were raised in *Day*.²²⁵ In the Board’s view such concerns are unfounded. For the majority of farms within the catchment consent is unlikely to be required. Consents will only be required for only farms that, fail to adopt sustainable farm management practices or desire to intensify beyond the natural capital capacity of the land. The Board does not see that as unreasonable or contrary to the sustainable management purpose of the RMA.

Exclusion of livestock from waterways

[440] The exclusion of livestock from waterways was a matter of concern for many submitters. As notified PC6 provided for the exclusion of all livestock from lakes, wetlands, and permanently flowing rivers and their margins on land less than 15 degrees in slope. On land greater than 15 degrees and stocking rates greater than 18 stock units, all livestock (excluding sheep) were to be excluded.

[441] Submissions on stock exclusion ranged from those strongly opposed to stock exclusion to those seeking total and permanent exclusion from all waterways. Opponents pointed to the cost of fencing, problems of weed control on fenced off areas, fire hazards, and the difficulty of fencing in flood prone areas.

²²³ A Dewes, Evidence in Chief, paragraph 110.

²²⁴ For example G&T Wilson (Submission #75).

²²⁵ at 5–215.

[442] By the end of the hearing a number of amendments had been accepted and included in exhibit 90 (PC6 with amendments acceptable to HBRC). These included the exemption of sheep from the stock exclusion requirements and the suggested preparation of a PMP as an alternative to fencing of waterways.

[443] In most situations the exclusion of livestock (other than sheep) from waterways and the preparation of a PMP as part of a FEMP for each property are fundamental to the management of phosphorus. As noted in the evidence of Dr McDowell, sources of phosphorus in waterways include soil losses, defecation and urination, the treading of grazing animals causing erosion of topsoil (or stream bank destabilisation), and losses from infrastructure such as farm tracks and lanes²²⁶.

[444] There was general consensus that the exception of sheep from the exclusion regime was sensible and pragmatic. We heard evidence from Mr Millner, that unlike cattle, the exclusion of sheep has little impact on modelled phosphorus losses. Unlike cattle and deer that seek out and wallow in waterways, sheep tend to avoid water other than for purely for drinking purposes. Fencing to exclude sheep is likely to require the traditional eight wire fencing which is much more capital intensive than electric fencing suitable to exclude cattle.

[445] We received a representation from the Hawke's Bay Deer Farmers Association who presented the New Zealand Deer Farmers Landcare Manual²²⁷. The mission statement of this document indicates it is a "... practical landcare guide of best practice for deer farmers to assist in minimising or eliminating any adverse environmental effects of deer farming and to enhance the long term sustainability of the New Zealand Deer Farming industry."

[446] This manual contains practical advice on achieving water protection, removing stock access where practical, management of deer wallowing and the use of LUC to achieve integrated land management based on the capability of the land and the most appropriate land use. Importantly there is a commitment within the group to implementing these measures.

²²⁶ R McDowell, Evidence in Chief, paragraph 3.5,

²²⁷ Exhibit 70 – the New Zealand Deer Farmers Landcare Manual, 2012.

[447] In order to demonstrate the implications of the requirement to fence all waterways, the delegation gave examples from the Riverslea Trust property of the fencing work that had been undertaken to date and the planned fencing yet to be undertaken. The cost of this fencing work is high and we heard that sometimes it may not be practical to fence all waterways due to the mob tendency behaviour of deer. They sought some other method of addressing phosphorus losses²²⁸.

[448] A very wide range of possible scenarios arising from differing topography, farming practices and stocking regimes makes it impossible in a regulatory situation to have a rule that suit all situations. Adherence to good farming practices such as those promoted by the New Zealand Deer Farmers Association and other farming organisations might provide appropriate mechanisms for achieving outcomes as good as or better than simply requiring comprehensive stock exclusion.

[449] The Board agrees that on land of 15 degrees slope or less, livestock (other than sheep) should be excluded from the beds and margins of any lake, wetland and flowing river (whether intermittent or permanent) by 31 May 2020. We also consider that for single paddocks on production land having a slope of greater than 15 degrees with a stocking rate (excluding sheep) exceeding 18 stock units per hectare, there should be either exclusion of all livestock (other than sheep) or if that is not reasonably practicable alternative measures should be undertaken. For example where fencing is impractical and other methods exist to mitigate phosphorus loss, these should be included in a PMP prepared as part of the FEMP.

[450] The Papanui, Porangahau, Maharakeke, Tukipo, Kahahakuri and upper Tukituki corridor catchments shown in Schedule XIV are an exception. In each case there are high DRP readings which call for tighter controls. If stock exclusion is not proposed resource consent will be required (as a restricted discretionary activity).

Amendments that the Board has made to PC6

[451] In summary the Board has made the following amendments to PC6 in relation to water quality:

²²⁸ R Lawson, Hawke's Bay branch of New Zealand Deer Farmers Association representation, page 3.

- instream DIN limits to maintain and enhance ecosystem health;
- introducing LUC based natural capital leaching rates;
- requirement for FEMPS throughout the catchment;
- stock management requirements in respect to waterways;

A track changed document showing the amendments to exhibit 90 is Appendix 5 of Volume 2 of this report.

[452] The Board believes the amendments it has made will simplify what was a relatively complicated regime.

Lake Hatuma (Whatuma)

[453] Many submitters questioned why Lake Whatuma had not been included in PC6. They emphasised its value as a water body and expressed concern about its present quality and exclusion from PC6.

[454] This issue was also addressed at the conferencing of experts in relation to water quality limits.²²⁹ The experts noted that there was very little information about the state of the lake in relation to ecological values and water quality. They noted that there was, however, anecdotal evidence suggesting that inputs of phosphorus from the immediate area may have contributed to the very high nutrient levels that are currently observable. Nevertheless they concluded that there was insufficient information to identify water quality limits for the lake. All they could do was recommend that investigations be undertaken.

[455] HBRC decided to expressly exclude Lake Whatuma from PC6. Like the experts, the Board does not have sufficient information to address issues concerning the lake (assuming that we have the necessary jurisdiction). Therefore we can only join the

²²⁹ Additional Expert Conferencing Joint Witness Statement to the Board of Inquiry – from O Ausseil, K McArthur and A Uytendaal on change 6 Water quality limits, 4 November 2013.

experts in recommending that investigations as to the state of the ecology, water quality and sources of contaminants entering the lake are undertaken in due course.

Issue four — water quantity

[456] As we have already mentioned, the issue of water quantity revolves around two inter-related matters: minimum flows and water allocation limits. Both are vitally important if freshwater values are to be safeguarded.

The minimum flow regime

[457] POL TT7 describes the policy framework underlying the minimum flow regime.²³⁰ All the planners present at the first conference endorsed this policy as it now stands. The Board also finds the policy satisfactory.

[458] The minimum flow regime is based on the three zones and flow measurement sites shown in Figure 4 at paragraph [154] above. These are:

- *Zone 1 (Lower Tukituki)* comprising the lower Tukituki River and the Papanui Stream, with flow measuring sites on the Tukituki River at Red Bridge and on the Papanui Stream at Middle Road;
- *Zone 2 (Waipawa)* comprising the Waipawa River and the Mangaonuku Stream, with flow measuring sites on the Waipawa River at SH2 and on the Mangaonuku Stream above the confluence;
- *Zone 3 (Middle-Upper Tukituki)* comprising the Tukituki River above Tapairu Road and the Tukipo River above Ashcott Road. Flow measuring sites are located on the Tukituki River at Tapairu Road and on the Tukipo River at SH50 and Ashcott Road.

These zone definitions and flow measuring sites have been generally accepted by the parties, including those who challenged other parts of the flow measuring regime.²³¹ Again, we accept them.

²³⁰ Footnotes included in this Policy have been omitted.

[459] Table 5.9.3 in PC6 is critical to the minimum flow regime. It defines the level of habitat protection, minimum flows, and the timing of the implementation of these matters. The Table follows:

Table 5.9.3: Tukituki River Catchment Minimum Flows

Surface Water Allocation Zone	Flow Management Site	Level of habitat protection	Minimum Flows (L/sec)	Period to which Minimum Flow applies
Zone 1 Lower Tukituki	Tukituki River at Red Bridge V22: 466581	Current level of protection	3500	Until 30 June 2018
		80% habitat protection for trout upstream of Red Bridge	4300	From 1 July 2018 until 30 June 2023
		90% habitat protection for trout upstream of Red Bridge	5200	From 1 July 2023
		80% habitat protection for trout between Red Bridge and Black Bridge	4300	From 1 July 2018
Zone 1 Papanui Stream	Papanui Stream at Middle Rd V22: 278432	90% habitat protection for longfin eel (estimated equivalent)	53	Ongoing
Zone 2 Waipawa River	Waipawa River at RDS/SH2 V22: 153339	Current level of protection	2300	Until 30 June 2018
		90% habitat protection for longfin eel	2500	From 1 July 2018
Zone 2 Mangaonuku Stream	Mangaonuku Stream U/S Waipawa V22: 116373	Current level of protection	n/a	n/a
		90% habitat protection for highest flow demanding fish species (estimated equivalent)	1170	From 1 July 2018
Zone 3 Tukituki River	Tukituki River at Tapairu Road V22: 183312	Current level of protection	1900	Until 30 June 2018
		90% habitat protection for longfin eel	2300	From 1 July 2018
Zone 3 Tukipo River	Tukipo River at SH50 U22: 948324	Current level of protection	150	Ongoing
Zone 3 Tukipo River	Tukipo River Ashcott Road U22: 080311	90% habitat protection for highest flow demanding fish species (estimated equivalent)	1043	From 1 July 2018

²³¹ While the location of the monitoring site on the Makaroro at Burnt Bridge measuring site might not be ideal the conclusion reached at expert conferencing on water science and hydrology at paragraph 40 was that there were limited options.

While the first two columns are not in dispute, amendments to various parts of the final three columns (level of habitat protection, minimum flows, and the period to which the minimum flows apply) are sought by some submitters.

[460] Arriving at an efficient and effective minimum flow regime for the Tukituki catchment requires a balancing of instream habitat protection against the interests of those abstracting water for on-land use. We now test the final three columns in Table 5.9.3 by examining these matters.

Level of habitat protection

[461] Habitat is a primary requirement of ecosystem health²³² and we proceed on the basis that it effectively provides a yardstick for protecting instream environmental values. The level of habitat protection proposed by HBRC for each zone is to be achieved through the specified minimum flows at each of the flow measuring sites. These flows are based on the needs of trout, longfin eel, or a species requiring a high flow (depending on which of these is present at the relevant flow management site). Compared with the current situation the minimum flows in PC6 will increase fish habitat protection by 5–18%, depending on the site.²³³

[462] When giving evidence for Horticulture NZ and others, Patrick (Kolt) Johnson, a hydrogeologist with Sinclair Knight Merz (SKM), explained:

“Habitat retention values are not a direct measure of the flow required to maintain or enhance fish populations. Rather they are more appropriately considered a measure of risk to fish populations.”²³⁴

Dr James Hayes (for HBRC), Dr Death, and Ms McArthur agreed at conferencing that if the surface water allocation limit is not substantially different from that proposed by PC6 as notified, then the proposed minimum flows would provide a reasonable level of habitat retention for the species identified.²³⁵

²³² J Hayes, Evidence in Chief, paragraph 11.7.

²³³ J Hayes, Evidence in Chief, paragraph 2.8.

²³⁴ K Johnson, Evidence in Chief, paragraph 5.4.

²³⁵ Expert Conferencing Joint Witness Statement to the Board of Inquiry — Water Science and Hydrology, 16 Oct 2013, paragraph 19.

[463] Dr Hayes had been asked by HBRC to comment on its approach to set minimum flows and allocation limits. His evidence was²³⁶:

“The hydraulic-habitat modelling, coupled with habitat retention analysis, that HBRC used to assess instream flow needs enables setting of minimum flows that provide consistent outcomes in terms of the level of habitat protection – because the method is habitat based. The modelling appears to have been done thoroughly.”

He considered that both the choice of flow critical species used for setting minimum flows and the flow levels that had been set were appropriate.

[464] EDS questioned why torrentfish, a native and threatened species, was not used to determine minimum flows. Dr Hayes explained:²³⁷

“.... setting flows for trout should provide reasonable levels of habitat protection for torrentfish too, bearing in mind that the productivity of a species like torrentfish for sustaining a fishery is not an issue, whereas with trout it is.”

In other words the protection of torrentfish *was* taken into account when setting the flow levels.²³⁸

[465] Another matter raised by EDS was whether there should be a 90% habitat protection for the *whole* catchment rather than allowing 80% below Red Bridge. Again we accept Dr Hayes evidence²³⁹ which was to the effect that the lower level of protection below Red Bridge reflects the different river morphology (it is deeper) and a more abundant food supply.

[466] Some general criticism was levelled at the effect of the high level of habitat protection on the availability of surface water for horticulture. But in the Board’s view that has to be tempered by taking into account any other sources of water that might be available to water users. We will return to that matter shortly.

²³⁶ J Hayes, Evidence in Chief, paragraph 2.3.

²³⁷ J Hayes, Tukituki Catchment Proposal Hearing Transcript, page 444.

²³⁸ This is consistent with the agreement recorded by the experts in the Expert Conferencing Joint Witness Statement to the Board of Inquiry — Water Science and Hydrology, 16 Oct 2013, at paragraphs 18 and 19.

²³⁹ J Hayes, Evidence in Chief, paragraph 5.11.

[467] Suffice to say at this stage that we are satisfied that the level of habitat protection proposed (generally 90% protection at the mean annual low flow (MALF)) is appropriate and not in any way excessive. In arriving at that conclusion we take into account that a 90% habitat protection at MALF effectively permits the loss of 10% of the natural habitat at that flow. It also gives rise to some loss of the natural variability of flows above MALF because water abstracters are allowed to continue abstracting right down to the minimum flow. This is sometimes referred to as “flat lining”.

Impact of minimum flows on water users

[468] Increasing minimum flows in rivers will inevitably result in increased restrictions on water users abstracting surface water from the rivers or groundwater where the extraction will have a depleting effect on river flows. Witnesses for the RWUG, Horticulture NZ and others, Mr Apple, and some individual horticulturists were concerned that the level of security of supply, already said to be inadequate during a significant drought, would become worse. They questioned the high level of habitat protection being sought at the expense of the water users.

[469] Robert Waldron, a water quantity scientist at HBRC, uses an irrigation water abstraction ban for 10 consecutive days (or more) during January or February as a measure of security of supply. He records that under current minimum flows that situation is reached on average every 4.3 years in the Waipawa River at SH2, every 3 years in the Tukituki River at Tapairu Road, and every 13 years in the Tukituki River at Red Bridge.²⁴⁰ When Dr Phillip Jordan, a senior hydrologist at SKM (for Horticulture NZ and others), separately modelled the hydrology and water use of the Tukituki catchment he made greater allowance for groundwater depleting effects on river flow. Dr Jordan concluded that at present the ten day ban occurs just over once every ten years in the Tukituki River at Red Bridge.²⁴¹

[470] Those periods can be compared with the periods that would apply under the proposed new minimum flows. Mr Waldron estimated the ten day ban will occur every 3.3 years in the Waipawa River at SH2, every 2 years in the Tukituki River at Tapairu

²⁴⁰ R Waldron, Evidence in Chief, Exhibit RJW3 – Predicted frequency of a year with a period of 10 or more consecutive days restricted during January and February.

²⁴¹ N Conland, M Sands and P Jordan, Joint Evidence in Chief, paragraph 5.14.

Road, and in the Tukituki River at Red Bridge every 6.5 years (increasing to 3 years when the minimum flow increases in 2023). Dr Jordan estimated that after 2023 the ban will occur every 4 years at Red Bridge.

[471] While the one in ten year period has been used by the experts there was little in the way of evidence about its acceptability to the farming community or others. Consequently we need to look elsewhere for guidance.

[472] Chapter 3 of the RRMP (which forms part of the Regional Policy Statement) includes the following policy for groundwater takes:

“POL 32 TECHNICAL PROCEDURE – IRRIGATION TAKES

- 3.9.31 To allocate groundwater for irrigation purposes on the basis of actual crop water requirements up to a maximum equal to that required during a one in ten year drought. The allocation assessment will take into account information on crop type, rainfall, potential evapotranspiration rates, and best irrigation management practices. The allocation assessment may also have regard to soil type and soil moisture capacity.

Explanation and Reason

- 3.9.32 POL 32 sets out the technical procedure that the HBRC will use for the allocation of groundwater for irrigation purposes. In essence, the HBRC will allocate groundwater based on crop water requirements during a specific probability of rainfall, adjusted according to local data for rainfall and evapotranspiration rates. For planning purposes it is necessary to establish a level of risk. A 10% risk that actual water needs will exceed the authorised volume in any year (ie: 1:10 year return period) is reasonable. The one in ten year level of risk means that the groundwater allocation will meet crop water requirements for a one in ten year drought and will exceed the crop requirements in the other nine years on average. The policy notes that the water will also be allocated on the basis of best irrigation management practices, rather than, for example, the amount of water required for an inefficient irrigation system.”

A similar policy and explanation relating to surface water takes is provided by POL 42, except that this policy is based on a one in five year drought rather than a one in ten year drought.

[473] Another chapter of the RRMP (not part of the Regional Policy Statement) includes the following policy:

“POL 73 ENVIRONMENTAL GUIDELINES – SURFACE WATER QUANTITY

- (a) To sustain aquatic ecosystems by establishing a minimum flow in a river as [stet] that level will maintain the existing ecosystem.

...

- (c) To provide a known level of risk to resource users by ensuring that, for rivers with an established minimum flow, the total allocation authorised through the resource consent process does not result in authorised takes being apportioned, restricted or suspended for more than 5% of the time on average during November–April.”

...

The explanation and reasons relating to POL 73 recognise that Hawke’s Bay is prone to extended dry periods and it is important to ensure that during these periods aquatic ecosystems are not placed under additional stress over and above that which occurs naturally.

[474] Notwithstanding those policies in the RRMP, PC6 proceeds on the basis that the one year in ten objective will not be achieved for surface water in the Tukituki catchment. POL TT8(1)(a) accepts:

“... that although allocation limits for surface water should be determined in order to provide a reasonable security of supply (such as avoiding an irrigation ban of ten consecutive days occurring more frequently than one year in ten), this is not achievable in the Tukituki River catchment given the minimum flows set in Table 5.9.3 and the existing volumes of water being abstracted.”

On the evidence before the Board we do not find it difficult to understand why HBRC arrived at that conclusion. Currently there is an over-allocation of surface water within the catchment (on the Ruataniwha Plains in particular) and it will not be possible to retain the desired security of supply if the proposed minimum flows are implemented.

[475] Obviously the higher minimum flows proposed in PC6 will lead to more frequent restrictions on the water users. The average frequency of the 10 consecutive day ban shortens by between 23–76%. It will occur on average every 3 years for the Tukituki River at Red Bridge and every 2 years for the Tukituki River at Tapairu Road. We acknowledge that these are very significant restrictions which will have serious implications for farmers and orchardists in the catchment.

[476] Stuart Ford, an Agricultural and Resource Economist presenting evidence for Horticulture NZ and others, told the Board that the value of the fishery being protected could not match the horticultural value lost through greater water restrictions. In effect he was questioning the balance struck in PC6. Mr Ford asked the Board to come up with an alternative regime.²⁴²

Striking the balance

[477] Striking the right balance between reserving river flow for habitat purposes and allocating water for abstraction requires consideration of the importance, on the one hand of the river habitat and amenity, and on the other, the needs of and the options available to those in the catchment who rely on water. While as far as possible the regime should meet *both* requirements, low river flows in the Tukituki catchment mean that each of these competing interests cannot be fully accommodated.

[478] Faced with that reality (which exists regardless of the precise level at which minimum flows are set) the Board has concluded that the sustainable management purpose of the RMA, as well as the objectives and policies of the NPSFM, are more likely to be achieved if the requirements of reasonable habitat protection prevail in the Tukituki catchment. To the extent that this means there will be insufficient water for irrigation, alternative sources of water, such as storage will need to be explored. This is effectively the conclusion reached by HBRC.

[479] Having reached that broad conclusion we come back to the specific issue facing the Board: whether the level of the minimum flows in Table 5.9.3 are efficient and effective taking into account the NPSFM and the benefits and costs of alternatives. We should also add that setting minimum flows for the catchment is effectively a first step towards determining the volume of water storage that might be required under the RWSS.

[480] At any particular site the natural habitat is based on the assessed habitat in terms of the 'weighted usable area' at the naturalised MALF for the site. The naturalised flow is the measured flow adjusted to take account of existing abstractions and discharges.

²⁴² S Ford, Supplementary Statement of Evidence, paragraph 5.3.

So it represents the low flow that would occur naturally.²⁴³ To a large extent the degree of retention of natural habitat depends on the importance of the species and the size of the river.

[481] Giving evidence for the RWUG, Dr John Bright of Aqualinc Research Limited was of the view that:

“The naturalised mean daily river flows are implausible and not fit for the purpose of determining the natural Mean Annual Low Flow.”²⁴⁴

This view seemed to be based on a water balance analysis that was not fully explained. It also related to the seasonal use estimates for individual irrigators and the projected restrictions they might face. It was not clear what actual effect (if any) there might be on the naturalised MALFs used. Despite Dr Bright’s evidence we are satisfied on the information before us that the naturalised MALFs used in arriving at minimum flow requirements are adequate.

[482] A significance ranking of relevant fish species used by the HBRC to estimate the required level of habitat retention is given in a technical report accompanying the plan change.²⁴⁵ Only “Large adult trout – perennial fishery and Diadromous galaxiid” are said to require 90% habitat retention. Other species range between 60% and 80%. HBRC also indicated that it had regard to the levels of habitat retention provided for in the pNES EFWL. In that standard 90% of MALF is recommended for rivers with a mean flow less than 5000 l/s and 80% of MALF for rivers with a mean flow greater than 5000 l/s.²⁴⁶ And in an addendum report Mr Waldron provides the minimum flows he considers necessary to provide varying levels of habitat protection for the various species and sites.²⁴⁷

[483] That detailed work was not significantly challenged and the experts accept that the outcomes are sound. Therefore given the need for habitat protection at the levels

²⁴³ R Waldron, Evidence in Chief, paragraph 3.3.

²⁴⁴ J Bright, Evidence in Chief Ruataniwha Water Users Group, paragraph 7.10.

²⁴⁵ K Johnson, Tukituki Catchment instream flow assessment, Folder 3 of Plan Change application documents, Tab 7, Table 14.

²⁴⁶ R Waldron, Memo – Tukituki Catchment Potential minimum flow sites and minimum flows, 26 February 2013, Folder 3 of Plan Change application documents, Tab 9, Table 4.

²⁴⁷ R Waldron, Tukituki Catchment instream flow assessment addendum report, February 2013, Folder 3 of Plan Change application documents, Tab 8, Tables 2, 3, 4 and 5.

specified in Table 5.9.3 from 1 July 2018, we are satisfied that the minimum flows specified in that table are appropriate.

[484] That leaves two matters. The first is whether the further increase in the level of habitat protection in the Tukituki River at Red Bridge to 90% from 1 July 2023 is justified. Although that issue was raised, the focus seemed to be as much on the timing of the increase as to whether the increase itself was justified. In any event we are satisfied that the increase *is* justified and the timing of the increase allows extractors sufficient time to make any adjustments that might be required.

[485] The other matter concerns the timing of the implementation of the new low flow regime. As Table 5.9.3 stands this will be 1 July 2018 (except for the further step at Red Bridge in 2023). Whether or not this provides a reasonable time for water users to adjust to the new regime depends on the steps that they might have to take to mitigate its effects.

[486] For water users requiring a greater security of supply there would appear to be three possible options. One is to switch their supply to deep groundwater, another is to join a community irrigation scheme (if one eventuates), and some form of on-farm storage might offer a third alternative in some cases. The Board recognises that all these have significant cost implications and that in some cases water users may not have any of these options.

[487] While we were not given enough detailed information about each user to enable us to assess their precise situation, it is clear that the surface water in the catchment is unable to meet current and future irrigation demands during periods of low flow. POL TT7(1)(b) proceeds on the basis that the timing of the new regime will enable existing water users a reasonable time to adapt to the reduced security of supply, find alternative sources of water, or provide on-farm water storage.

[488] The Board acknowledges that this is a challenging time frame and that many submitters are opposed to it. However, having considered the competing arguments we have decided that the proposed timetable is reasonable in all the circumstances, particularly taking into account the regime for allocating groundwater to existing consent holders, which we will discuss shortly.

Summary of our findings on minimum flows

[489] The Board finds that POL TT7 and Table 5.9.3 reflect the correct balance between instream values and out of stream uses. We are also satisfied that the timing of the implementation of the new low flow regime is appropriate in all the circumstances. Consequently no change to that policy or table is required. However low flows are inextricably linked with allocation limits and we now turn to that topic.

Allocation limits for groundwater and surface water

[490] POL TT8 outlines the broad approach of PC6 to the allocation of surface water and groundwater. After submissions had been lodged it was modified to reflect some of the points raised in submissions, and following modification it was supported by all the planners who were present at the first conference.

[491] The Board accepts that POL TT8 does not require any modification we will reproduce it because it provides an important context for the discussion that follows:

“POL TT8 ALLOCATION LIMITS

1. To manage the taking of surface water and groundwater in the Tukituki River catchment by:
 - (a) Recognising that although allocation limits for surface water should be determined in order to provide a reasonable security of supply (such as avoiding an irrigation ban of ten consecutive days occurring more frequently than one year in ten), this is not achievable in the Tukituki River catchment given the minimum flows set in Table 5.9.3 and the existing volumes of water being abstracted;
 - (b) Recognising that there is a significant degree of interconnectedness between groundwater in the Ruataniwha Basin and surface water flows within the basin as a whole and consequently surface flows further downstream;
 - (c) Setting surface water and groundwater allocation limits that are based on the existing volume of consented abstraction (Tables 5.9.4 and 5.9.5 and Schedule XVIII);
 - (d) Applying the Table 5.9.4 and 5.9.5 water allocation limits only to consented takes and not to takes allowed under section 14(3)(b) of the RMA, nor to takes occurring prior to 4 May 2013 under Rules 53 and 54, nor to the construction and operation of in-stream dams (including damming, taking, diverting, using and discharging), nor to downstream takes of

water released from an instream dam for members of a Community Irrigation Scheme.”

For completeness we should record that rules 53 and 54 referred to in (d) concern ‘minor’ takes and uses of surface water and groundwater.

[492] Actual surface water and groundwater allocation limits for PC6 are contained in the following tables:

Table 5.9.4: Surface Water Allocation Limits

Surface Water Allocation Zones (Schedule XVI)	Direct Take Allocation Limit (L/sec)	Surface Water Depletion Allocation Limit (L/s)	Total Allocation Limit (L/sec)
Zone 1 — Lower Tukituki River	519	412	931
Zone 2 — Waipawa River and Tributaries above RDS/SH2	643	269	912
Zone 3 — Tukituki River and Tributaries above Tapairu Road	763	716	1,479
Sub- catchment allocation of allocation limit for Zone 3:			
Zone 3 — Kahahakuri Stream	176	174	350
Zone 3 — Makaretu Stream	32	8	40
Zone 3 — Tukipo River	152	84	236
Total catchment	1,925	1,397	3,322

Table 5.9.5: Groundwater Allocation Limits

Groundwater Allocation Zones (Schedule XVII)	Allocation Limit (m ³ /year)
Zone 1 — Otane Basin	4,134,000
Zone 2 — Ruataniwha Basin north of the Waipawa River	7,224,000
Zone 3 — Ruataniwha Basin south of the Waipawa River	21,277,000
Rest of the catchment	No limit set ²⁴⁸

Again both these tables reflect significant modifications that were made during the inquiry process.

²⁴⁸ Groundwater takes located outside of Groundwater Allocation Zones 1 to 3 are Discretionary Activities (wording from Plan Change 6 dated 19 January 2014).

[493] As now presented, Table 5.9.4 which relates to *surface water*, does not continue to draw critical comment that would warrant any change, and we accept it. However Table 5.9.5, which relates to *groundwater*, is an entirely different proposition.

Groundwater allocation limits — Table 5.9.5

[494] The three groundwater zones referred to in this table are shown on Figure 5 at paragraph [154] above. As can be seen from the table, Zones 2 and 3 make up the Ruataniwha Basin with the result that the total allowable abstraction from the Ruataniwha aquifer is in round figures 28.5million m³/year (7,224,000 m³ plus 21,277,000 m³).

[495] Originally Table 5.9.5 carried an allocation limit of 25million m³/year for the Ruataniwha aquifer. However during the hearing HBRC conceded that this limit needed to be lifted to 28.5million m³/year because this higher figure more closely matched abstractions from the aquifer that are currently consented and exercised. On top of that figure are permitted takes under s 14(3)(b) of the RMA or under the RRMP, which are estimated to be around 1.5million m³/year. On those figures therefore, a total of 30million m³/year is currently being extracted from the Ruataniwha aquifer.

[496] The original figure of 25million m³/year arose from a model describing the behaviour of groundwater in the Ruataniwha aquifer that had been developed by Dr Baalousha. He considered that abstraction at that rate (which would irrigate 6–7000ha) reduced groundwater levels, increased losses from the rivers to the groundwater, and reduced river flows. He did not agree that there should be any increase in the groundwater extracted from this basin.²⁴⁹

[497] On the other hand Ian McIndoe, Principal Engineer with Aqualinc Research Limited,²⁵⁰ was of the opinion that groundwater from the Ruataniwha aquifer could be used to irrigate an area of 12,659ha (an area said to be covered by existing consents if they were fully utilised). According to Mr McIndoe this would require an increase in groundwater abstraction to 45million m³/year which he considered could be “easily”

²⁴⁹ Expert Conferencing Joint Witness Statement to the Board of Inquiry — Water Science and Hydrology, 16 October 2013, paragraph 37.

²⁵⁰ Providing evidence for the Ruataniwha Water Users Group and Mr Apple.

sustained by the aquifer.²⁵¹ Mr McIndoe did not consider there was any shortage of groundwater in the Ruataniwha basin.

[498] Support for the view that the aquifer could sustain 45million m³/year comes from Julian Weir, Senior Engineer with Aqualinc Research Limited (on behalf of the RWUG).²⁵² Mr Weir developed Aqualinc's model of the Ruataniwha groundwater system which predicts the response of groundwater levels and river flows to irrigation development within the basin.²⁵³ One of the scenarios he modelled involved the extraction of groundwater from the aquifer to irrigate 12,659ha.

[499] Further support comes from Hugh Middlemis,²⁵⁴ Senior Principal Water Resources Engineer at RPS, Adelaide, South Australia, a witness for HBRC. Mr Middlemis was the principal author of the 2001 Groundwater Flow Modelling Guidelines now adopted in Australia as the best practice guideline. He noted that both the HBRC model (Dr Baalousha) and the Aqualinc model (Mr Weir) predicted "similar and quite consistent" responses to irrigation development.²⁵⁵

[500] At conferencing the hydrological experts agreed that "the groundwater system has the capacity to supply groundwater for existing levels of irrigation (6,000–7,000ha) without further decline in river flows or groundwater levels."²⁵⁶ But they were not in agreement about whether the aquifer could sustain abstraction to the level that would be required to irrigate 12,659ha (45million m³/year).

[501] For their part Mr McIndoe, Mr Weir and Mr Middlemis agreed:²⁵⁷

"37. The groundwater system has the capacity to supply additional groundwater over and above existing levels of irrigation based on the model scenarios that consider 12,659–13,000ha of irrigation. This is based on the model predictions that groundwater levels and river flows will lower to a new lower, dynamic equilibrium and do not continue to decrease thereafter."

²⁵¹ I McIndoe, Evidence in Chief Ruataniwha Water Users Group, paragraph 12.8.

²⁵² Who gave evidence for the Ruataniwha Water Users Group.

²⁵³ J Weir, Evidence in Chief, paragraphs 4.13–4.19.

²⁵⁴ Providing evidence as a HBRC witness.

²⁵⁵ H Middlemis, Rebuttal evidence, paragraphs 2.2 and 2.3.

²⁵⁶ Expert Conferencing Joint Witness Statement to the Board of Inquiry — Water Science and Hydrology, 16 October 2013, paragraph 36.

²⁵⁷ Expert Conferencing Joint Witness Statement to the Board of Inquiry — Water Science and Hydrology, 16 October 2013, paragraph 37.

Dr Baalousha disagreed. Having assessed the evidence we accept the conclusion expressed by the three experts.

[502] The hydrology conferencing report also records that Dr Baalousha and Mr Middlemis supported the following proposition²⁵⁸:

“38. Given the uncertainty in modelling predictions and the non-uniqueness of model parameterisations (Barnett *et al*, 2012), an adaptive management approach is recommended to permit a reasonable or conservative scale of development initially, with monitoring and review to validate models before considering changes to the scale of development.”

Mr McIndoe, Mr Weir and Dr Zemansky disagreed.

[503] The Board also disagrees with the suggested adaptive management approach for two primary reasons. First, the Ruataniwha aquifer is largely replenished from rainfall with an annual recharge volume of 255million m³. Extraction at the rate of 45million m³/year will represent only about 20% of the recharge which is well within the guideline of not more than 35% recommended in the pNES EFWL.²⁵⁹ Secondly, the lag time between extraction and any effect on the aquifer means that it is likely to take a long time before any useful information is received.

[504] Before examining the Ruataniwha aquifer any further we should briefly mention two other groundwater resources in the Tukituki catchment. The first is the Otane Basin which has an allocation limit in Table 5.9.5 of 4,134,000m³/year. There does not appear to be any significant dispute about that figure, and we accept it.

[505] The other groundwater resource at the lower end of the Tukituki River (Tukituki aquifer) is interconnected with the Heretaunga Plains aquifer. On 2 August 2012 Ms Codlin sent a memo to Xan Harding, a grape grower in the lower Tukituki, advising:

“... the effect of reducing river flows as a result of groundwater takes in this very bottom reach of the catchment is unlikely to be of such a magnitude that it would result in a significant reduction of the physical habitat availability in the

²⁵⁸ Expert Conferencing Joint Witness Statement to the Board of Inquiry — Water Science and Hydrology, 16 October 2013, paragraph 38.

²⁵⁹ Proposed National Environmental Standard on Ecological Flows and Water Levels, discussion document, March 2008, Page 26.

Tukituki River or a significant adverse biological effect on species in this reach.”²⁶⁰

Consequently no allocation limit is set for the Tukituki aquifer unless takes will have a depleting effect on the Tukituki River (we will discuss the connection between groundwater and surface water in due course).²⁶¹

[506] The explanation for this approach can be found in a report by Simon Harper on behalf of HBRC which is included in the application documents:

“At the lower end of the Catchment the Tukituki River intersects with the Heretaunga Plains and forms the lower Tukituki aquifer which overlies and merges with the main Heretaunga Plains aquifers. Groundwater data such as groundwater levels and aquifer tests suggest the two aquifer systems are hydraulically connected. Pumping from either aquifer system is therefore likely to affect the other. For this reason, both aquifer systems need to be managed together. As such the groundwater resource within the Tukituki aquifer is to be managed as part of the greater Heretaunga Plains aquifer system and not as a separate groundwater resource of the Tukituki River Catchment.”²⁶²

The Board understands that the Heretaunga Plains aquifer is a major source of irrigation water and that any groundwater abstractions from the lower Tukituki area will be small by comparison.

Sustainable volume of groundwater that can be abstracted from the Ruataniwha aquifer

[507] Determining the sustainable yield of the Ruataniwha aquifer is vitally important. The aquifer provides a natural storage system which is substantially unaffected by periods of surface water low flow.

[508] Neither of the aquifer modellers (Dr Baalousha and Mr Weir) suggested that there was any physical difficulty with extracting more than 30million m³ from the aquifer. Rather the limitation on abstraction arises from the surface flow effects of lowering groundwater levels (particularly the reduced flow of some spring flows and the effects of reduced stream flows on habitat). It is therefore necessary to consider two

²⁶⁰ X Harding, Harding Family Trust, Evidence in Chief, Appendix 2 – Memo from H Codlin, 2 August 2012.

²⁶¹ At paragraphs [545] – [552].

²⁶² S Harper, Tukituki Catchment Groundwater Resources, January 2012, Folder 3 of Plan Change application documents, Tab 2, page 24

particular effects: first, the effect of abstracting groundwater on surface flows and second, the effect of lowering groundwater levels.

[509] As to the first effect, Mr McIndoe estimated (using Mr Weir's modelling) that:

“... the impact of current abstraction on 7-day mean annual low flow (MALF) is about 0.78 m³/s, (780 l/s) with about half each of the effect seen in the Waipawa and Tukituki sub-catchments.”²⁶³

Mr Waldron's figure is slightly higher at 803 l/s.²⁶⁴ These figures reflect abstraction of groundwater from the aquifer at the rate of 25million m³/year.

[510] If abstraction is lifted to 45million m³/year Mr McIndoe calculates that the MALFs in the rivers would be reduced by another 650 l/s (again presumably split approximately equally between the Waipawa and the Tukituki Rivers). This would equate with a total reduction in surface flows of 1430 l/s.²⁶⁵ On Mr Waldron's figures the total reduction would be 1314 l/s²⁶⁶ and Mr Weir arrived at the same figure as Mr McIndoe.²⁶⁷

[511] Adopting a conservative approach, the Board proceeds on the basis that extraction of 45million m³/year from the Ruataniwha aquifer will reduce flows in the Waipawa and Upper Tukituki Rivers (combined) by 1430 l/s. Of that 780 l/s will be attributable to existing takes. We also proceed on the basis that most of the wells within groundwater allocation zones 2 and 3²⁶⁸ involve 'deep' takes of more than 50 metres, and that under POL 11 (which we discuss shortly), those takes would not have to cease when minimum surface flow levels are reached.

[512] While in the context of the flows in these rivers a reduction in flow of 1430 l/s might seem relatively small, the evidence suggests that such a reduction could nevertheless have an adverse effect on instream habitat (which we have used as the yardstick for safeguarding environmental values). Equally importantly it would tend to

²⁶³ I McIndoe, Evidence in Chief, paragraph 13.11.

²⁶⁴ R Waldron, Tukituki Catchment Proposal Hearing Transcript, page 328.

²⁶⁵ I McIndoe, Evidence in Chief, paragraph 13.16.

²⁶⁶ R Waldron, Tukituki Catchment Proposal Hearing Transcript, page 331.

²⁶⁷ J Weir, Tukituki Catchment Proposal Hearing Transcript, page 1452.

²⁶⁸ The map showing these zones can be found at paragraph [153] above.

undermine the low flow regime because takes from deep groundwater do not have to cease when the low flow limit is reached. It follows that unless there is some way of mitigating the effect on surface flows it would be very difficult to justify any increase from the limit of 28.5million m³/year proposed by HBRC.

[513] We now turn to the second effect, namely, the lowering of groundwater levels to a “new lower, dynamic equilibrium” without any further decrease thereafter.²⁶⁹ Mr McIndoe said that, depending on the depth and location of the additional takes, there might be localised interference effects which could be managed at the individual consent level. But he added:²⁷⁰

“These localised effects should not be confused with the ability of the groundwater system to supply additional water.”

As we have already noted, Mr McIndoe was confident that the groundwater system could “easily” sustain the 45million m³/year take.²⁷¹

[514] Mr Weir reached a similar conclusion.²⁷² He considered that there would be a “relatively small” change in the groundwater level²⁷³ and that the greatest changes would occur near pumping wells and the changes could vary with depth. So long as the localised effects were managed Mr Weir did not think existing groundwater users would be affected.

[515] Even if there is some effect on other users it is necessary to keep in mind that in *Opiki Water Action Group Incorporated, Spall Farms Limited & Ors v The Manawatu Wanganui Regional Council*²⁷⁴ the Environment Court held that at least up to the point where access to the water resource is lost altogether, there is no guarantee of, or right to, pressure in a bore.

²⁶⁹ Expert Conferencing Joint Witness Statement to the Board of Inquiry — Water Science and Hydrology, 16 Oct 2013, paragraph 37.

²⁷⁰ I McIndoe, Evidence in Chief Ruataniwha Water Users Group, paragraph 12.10.

²⁷¹ See paragraph [498].

²⁷² J Weir, Evidence in Chief, paragraphs 7.8 and 7.10.

²⁷³ J Weir, Tukituki Catchment Proposal Hearing Transcript, page 1454.

²⁷⁴ *Opiki Water Action Group Incorporated, Spall Farms Limited & Ors v The Manawatu Wanganui Regional Council*, NZEnvC Wgtn, W64/2004, 12 August 2004 at [14].

[516] Having considered these matters, the Board accepts that of itself, the small reduction in groundwater levels does not present a problem. On the other hand, any reduction in minimum flows resulting from the extraction of groundwater presents an adverse effect that will have to be overcome.

[517] Although the Board accepts that the economic wellbeing of the rural community requires the Ruataniwha aquifer to be fully utilised so that further development can be achieved, the minimum flow levels already discussed represented a bottom line in terms of the RMA and the NPSFM. While the revised limit of 28.5million m³/year proposed by HBRC did not appear to be of particular concern to the experts, it is the cumulative effect of lifting the limit to 45million m³/year that would be incompatible with the NPSFM and environmentally unacceptable *unless* the adverse effect of increasing that limit (reduced surface flows) can be appropriately avoided, remedied or mitigated.

[518] Given these matters the Board was driven to the following conclusions:

- If at all possible it is desirable for the limit on extraction from the aquifer to be lifted to 43.5million m³/year²⁷⁵ (plus 1.5million m³/year for “permitted” uses) because the expert evidence tells us that this is a sustainable yield and it supports the economic wellbeing of the rural community.
- But this can only be achieved if adverse effects on surface flows are adequately avoided, remedied or mitigated.
- In other words, any reduction in the minimum flows that have been set by PC6 will need to be mitigated to the extent and for the period that the minimum flow regime would be compromised.
- Leaving aside the RWSS or other storage possibilities, deep groundwater within the Ruataniwha aquifer represents the only source from which the necessary mitigation could be achieved.

²⁷⁵ In arriving at that figure we have started from the 45million m³/year used by the experts, and reduced it by 1.5million m³/year to allow for permitted takes. This figure of 43.5million m³/year would also include any supplementing flows.

Supplementing river flows from deep groundwater

[519] The possibility of supplementing low river flows from deep groundwater occurred to the Board early in the hearing, and it was raised by Board members with the relevant witnesses. Typical of the responses was Mr Waldron's comment "... if it was feasible you potentially could do it."²⁷⁶

[520] Taking the larger effect of 1430 l/s on river flows we apprehend that it would take 1.24million m³ to replace those minimum river flows for 10 days. Twice the volume would be required for 20 days and even this would represent only 5.49% of the groundwater abstracted from the aquifer for irrigation over the course of a year. Put another way, supplementation from deep groundwater to the rivers for 10 days would equate with a reduction of about 250ha of the area of land that could be irrigated, and for 20 days that area would need to be doubled.

[521] Having given this matter a good deal of thought the Board has concluded that supplementation of low river flows from deep groundwater is a realistic possibility. If extraction is lifted to 43.5million m³/year the expert evidence indicates that around 12–13,000ha could be irrigated which would represent an increase of 6–7000ha beyond the current situation.

[522] The Board recognises that some groundwater users might be remote from access to rivers or streams requiring supplementary flows. But we do not believe that this is an insurmountable hurdle. One way that it might be overcome is by a group approach on the part of the irrigators. Another might be by HBRC providing the necessary well/s, presumably at the cost of those who would benefit from it.

[523] Obviously the issue of supplementation will require further consideration and it is possible that a further plan change will be required. We contemplate that this supplementation regime can be in place by 1 July 2018 when the new minimum flow/allocation regime will come into force (except for the earlier review of existing consents). At this stage it is only necessary for the Board to provide a framework within

²⁷⁶ R Waldron, Tukituki Catchment Proposal Hearing Transcript, page 345.

which the allocation limit for Zones 2 and 3 can be lifted to 43.5million m³/year *provided* the necessary supplementation regime is in place. Details can be worked out later. The Board anticipates that allocation of this additional 15million m³/year will be managed through the consent process.

[524] One of the matters that the Board has considered is whether the supplementation regime should apply on a pro rata basis across *all* consents for the extraction of groundwater from the Ruataniwha aquifer, or whether it should only apply to consents for the additional 15million m³/year. When considering this matter we took into account both the practical realities of implementing a supplementation regime and the issue of fairness between consent holders.

[525] As to the first matter (practical realities) the Board is conscious that the figure of 28.5million m³/year represents abstractions *that are currently consented and exercised*. In other words they are akin to existing uses. Except to the extent that seasonal and annual volumes will be considered when these consents are renewed (or are earlier reviewed), the underlying philosophy behind PC6 is that those consents should be renewed. To impose a supplementation requirement on those consent holders would be contrary to that policy, and we do not favour it.

[526] In relation to the other matter (fairness) the Board proceeds on the basis that allocation of a further 15million m³/year per annum to new consent holders or by way of increased abstraction for existing consent holders falls into an entirely different category. They are obtaining an *additional and new* allocation of the Ruataniwha resource for commercial purposes, and we do not see anything unreasonable or unfair in requiring them to carry responsibility for mitigating the adverse effects that arise directly and indirectly from this additional abstraction. In pragmatic terms, they should be responsible for the *whole* of the supplementation requirement.

Amendments to policies/tables that are required to allow supplementation of surface water from groundwater

[527] It will be necessary for the allocation regime currently proposed in PC6 to be modified so that:

- The availability of deep groundwater in Zones 2 and 3 is increased from 28.5million m³/year to 43.5million m³/year once a supplementation regime is in place.
- Allocation of up to 28.5million m³/year (tranche 1) will continue to be a restricted discretionary activity and subject to the rules currently proposed in PC6.
- Between 28.5million m³/year and 43.5million m³/year (tranche 2) allocation will only be permitted when the supplementary flow regime is in place. Allocation will be a discretionary activity and new rules will be required.
- Beyond 43.5million m³/year allocation of water from the Ruataniwha aquifer will be a non-complying activity.

We are satisfied that all these amendments are within scope.

[528] Most of the factors that led the Board to this structure have already been described. However we will briefly explain the basis on which we have arrived at the categorisation of the consents for tranche 1 and tranche 2.

[529] As we have already mentioned, tranche 1 relates to existing consents to the extent that they are being currently utilised and they can be equated with existing uses. In the Board's view the restricted discretionary activity status proposed by HBRC is appropriate and the provisions of PC6 proposed by the Council should stand for that tranche.

[530] By comparison a greater level of control is desirable for tranche 2 because it represents a new and additional abstraction which is subject to the supplementation requirement. We have decided that the appropriate consent category for this tranche (provided the supplementation requirement is in place) should be a discretionary activity.

[531] Finally, we accept that there is evidence that extracting more than 43.5million m³/year might be safe. However we believe that any such abstraction should be subjected to the rigorous test that arises for a consent for a non-complying activity.

[532] To achieve the foregoing the Board has amended exhibit 90 as shown in the track changed version in Appendix 5 of Volume 2 of this report. The amendments are shown in red.

[533] That completes the Board's consideration of the first two policies (POL TT7 and POL TT8) and their associated tables. We now we turn to the remaining provisions concerning water quantity.

Seasonal and annual volumes

[534] Schedule XVIII provides the framework for determining seasonal and annual volumes. As originally notified this schedule attracted widespread opposition and it was withdrawn by HBRC to enable a replacement schedule to be formulated. We understand that all the planners who had an interest in the schedule were involved in the reformulation. During the hearing the Board was kept informed and at one stage indicated its thinking at the time about a draft of the replacement schedule. Mr van Voorthuysen reported that the new schedule has been agreed to by all those directly involved.

[535] The Board notes that to a large extent the new schedule uses the existing policies in the RRMP as a framework for arriving at seasonal and annual allocations. In this way it can be seen as giving effect to the Regional Policy Statement (RPS). We are satisfied that the new approach in schedule XVIII is appropriate and that the new schedule is within scope. The Board accepts it.

Implementing the minimum flow regime and allocation limits

[536] This is of course an important component of both minimum flows and allocation limits. For this reason it is helpful to reproduce the entire Policy of TT9:

POL TT9 - IMPLEMENTING MINIMUM FLOW REGIME AND ALLOCATION LIMITS

1. To implement the minimum flow regime and allocation limits in the Tukituki River catchment by:
 - (a) Allowing the renewal of existing surface water and groundwater take consents provided:
 - (i) There is no increase in the rate or the maximum 7-day volume of take, except as provided for in (a)(ii) and (b) below;
 - (ii) A seasonal volume or annual volume is imposed in accordance with Schedule XVIII.
 - (aa) Reviewing all consents that are not otherwise expiring to impose seasonal and annual volumes in accordance with POL TT9(1)(a) as necessary to ensure integrated management of surface water and groundwater resources. Ruataniwha Basin groundwater take consents will be reviewed in 2015.
 - (ab) Prior to the replacement and review of existing Ruataniwha Basin consents in 2015 or the confirmation of seasonal volumes calculated in accordance with Schedule XVIII (whichever occurs first), in order to avoid potential over-allocation the Hawke's Bay Regional Council will not grant consents for new water (being any increase in existing authorised takes or any applications for new takes).
 - (b) After the replacement and review of existing Ruataniwha Basin consents in 2015, allowing for the further allocation of water, including water that is freed up through the surrender or non-replacement of existing takes by the consent holder, provided the new allocation does not result in any exceedence of the allocation limits in Table 5.9.4 or Table 5.9.5 and, except as provided for in (ba) below, subject to seasonal volumes being imposed in accordance with (a)(ii) above.
 - (ba) Not imposing annual volume restrictions on takes for frost protection.
 - (c) Assessing groundwater take applications against OBJ 44, POL 77 and POL TT11 in areas where no groundwater allocation limit is set in Table 5.9.5.
 - (d) Not including any taking of water allowed under s 14(3)(b) of the RMA or Rules 53 and 54, or Rule TT3 when summing volumes of take for comparison against the surface water allocation limits in Table 5.9.4 and the groundwater allocation limits in Table 5.9.5.
 - (e) Reviewing the need, in 2020 and 2025, to increase the Table 5.9.4 and 5.9.5 allocation limits to include a provision for existing and future s 14(3)(b) takes for animal drinking water in the event of a Community Irrigation Scheme progressing.

- (f) Other than for takes which involve the storage of water behind an instream dam and downstream takes reliant on the release of that stored water, when a river is at or below its Table 5.9.3 minimum flow, takes from that river and groundwater takes to which minimum flow restrictions apply in accordance with POL TT11 shall be managed as follows:
- (i) The taking of water allowed by section 14(3)(b) of the RMA may continue without further restriction;
 - (ii) Takes permitted under Rules 53 and 54 may be required to reduce their daily rate of take if Hawke's Bay Regional Council issues a Water Shortage Direction to that effect;
 - (iii) Consented takes for public water supplies, animal drinking water, animal welfare and sanitation (including dairy shed wash down and milk cooling), marae, schools and other educational facilities shall be required to reduce their daily rate of take to a reasonable and justifiable amount as specified in their consent conditions;
 - (iv) Takes for frost protection and takes for filling agrichemical spray tanks shall continue to be allowed without further restriction;
 - (iva) The taking of water authorised for the sole purpose of avoiding the death of horticultural or viticultural root stock or crops shall be allowed to occur to any extent allowed by conditions of consent as follows:
 - 1. Water allocated for this purpose shall not exceed a cumulative instantaneous limit across all Surface Water Allocation Zones of 200 L/s;
 - 2. The water shall only be available five days (120 hours) after minimum flow cessation take restrictions are imposed and where no practicable alternative sources of water are available or accessible;
 - 3. Access to the water shall be provided as a first priority to the protection of the root stock of permanent horticulture such as orchards and viticulture; and
 - 4. Access to the water shall be provided as a second priority to the protection of crops (excluding pasture species, animal fodder crops and maize).
 - (v) All other consented takes shall cease, or be managed in accordance with POL TT11.

Objective 44 and POL 77 of the RRMP which are referred to in clause (1)(c) relate to the maintenance of a sustainable groundwater resource.²⁷⁷

[537] Like many other policies, this policy underwent significant amendment during the course of the hearing. The amended version satisfied most of the concerns presented to the Board. Only three matters need to be mentioned.

[538] First, because the Board has now made provision for the extraction from the Ruataniwha aquifer to be increased (subject to the provision of supplementation flows), the words in POL TT9(1)(ab) “in order to avoid potential over-allocation the Hawke’s Bay Regional Council will not grant consents for any new water (being any increase in existing authorised takes or any applications for new takes)” are no longer applicable and will be deleted accordingly.

[539] Secondly, POL TT9 (1)(f)(iva) was introduced by HBRC during the inquiry process to satisfy concerns raised by many horticulturalists and orchardists. While they were pleased with the step taken by HBRC to protect rootstock, some felt that it did not go far enough. Having considered their views the Board has decided that the clause as it now stands provides the necessary safety valve.

[540] Thirdly, some parties referred to this implementation regime as ‘grandfathering’ the existing permits and perpetuating the existing over-allocation of the Tukituki water resource. The Board does not accept that proposition. This implementation plan holds the current allocations, implements a review which will also consider seasonal and annual volumes, provides steps to achieve the specified minimum flows, and permits the continuation of essential water uses. In the Board’s view it is an effective and efficient policy sequence which gives effect to the NPSFM.

[541] Fourthly, because deep groundwater does not affect minimum flows in the rivers or allocation limits, POL TT9(1) does not need to apply to deep groundwater

²⁷⁷ Takes of groundwater are to be managed so that abstraction does not exceed the rate of recharge, supplies of good quality groundwater are available, existing groundwater takes are not disadvantaged by new takes and there is no adverse effects on rivers, lakes, springs or wetlands.

abstractions. Accordingly POL TT9(1) has been amended by exempting deep groundwater from it.

High flow allocation regime

[542] As explained in the s 32 Evaluation Report ²⁷⁸ there are various ways of allocating flows above the median flow, some more complicated than others. The method chosen in POL TT10 and Table 5.9.6 is simple, it provides for on-farm storage and it retains the natural flushing of freshes in the rivers. While Irrigation New Zealand Incorporated (Irrigation NZ), Horticulture NZ and others and the RWUG sought a more complicated formula, they did not substantiate that position to the Board's satisfaction.

[543] All the planners agreed with this policy at conferencing and we are not aware of any continuing disagreement between the water science and hydrology experts on this matter. The Board considers that the proposed provision in POL TT10 and Table 5.9.6 allow for the efficient and cost effective taking of surface water for on-farm storage at higher river flows while retaining the important natural flushing flows in the rivers.

Managing groundwater takes that are hydraulically connected to surface water

[544] The Board has already touched on this matter when discussing the volume of water that can be sustainably abstracted from the Ruataniwha aquifer. However, some further explanation is required.

[545] Over some reaches of the rivers in the Tukituki catchment, water flows from the river or stream to the groundwater thus depleting the river or stream. This occurs where the streambed is permeable and the surface water level is higher than the immediate groundwater level. In other reaches water flows from the groundwater into the stream, thus enhancing the surface flow. This occurs where the groundwater level exceeds the surface water level. Abstractions of groundwater reduce the groundwater level and so

²⁷⁸ H Codlin and R van Voorthuysen, Section 32 Evaluation Summary Report for proposed Plan Change 6 Tukituki River Catchment, adopted by council on 24 April 2013, Folder 1 of Plan Change application documents, Tab 3, page 65.

may reduce surface water flows. We have already recorded the estimated effect of lower groundwater levels on stream flows.²⁷⁹

[546] Where the point of groundwater abstraction is close to a river or stream it may be hydraulically connected (that is, in a short time there is a reasonably direct effect on the river flow). In order to manage surface flows, some control of those groundwater abstractions that affect stream flow is needed. The relevant policy is provided by POL TT11 and Table 5.9.7. Wells deeper than 50m are excluded from this policy because they are considered to be deep enough or remote enough not to significantly affect stream flows within the time frame of a season or a year.

[547] Two matters remain in contention.

[548] The first concerns the operation of the policy in the lower Tukituki area. Timothy Baker, a senior hydrogeologist with SKM, gave evidence and participated in the expert conferencing for Horticulture NZ. He considered a cut-off depth of 40m was more appropriate in the lower Tukituki catchment. His recommendation was:

“... to adopt a 40 metre cut off in the Lower Tukituki and to keep the currently proposed 50 metre cut off in the Upper Tukituki. I believe this would also be sufficiently conservative to ensure potential surface water depletion effects are captured in policy TT11.”²⁸⁰

For HBRC Mr Robinson responded that the depth figure was just a means to describe when an assessment of the hydraulic connectivity ought to be required, not a statement about the actual connectivity.

[549] By way of further amplification of the point he was making Mr Baker explained:

“Mr Thorley has provided the cross-sections and we agreed that a cut off, it needed to be at a depth where we knew we were in the confined system and not connected. I believe that that depth is at 40 metres. Geologically I think those maps show that. Putting it to 50 is being more conservative but I don’t see any reason why it shouldn’t be 40. 40 was the original value that we were using and it moved to 50 and I believe 50 was adopted because we wanted – well, other experts wanted a single value for the entire catchment. I believe in the lower

²⁷⁹ See paragraph [509] above.

²⁸⁰ T Baker, Tukituki Catchment Proposal Hearing Transcript, page 1883.

Tukituki 40 is more appropriate. 50 is appropriate for the upper Tukituki or the Ruataniwha.²⁸¹

...I'm choosing 40 on a geological basis regardless of the number of wells that are in or out of it. There could be no wells there, there could be no wells below 30, I would still choose 40 based on the geology. That's shown in those concepts."²⁸²

[550] The Board finds Mr Baker's view compelling. A 40m cut-off would avoid the time and expense (which on the geological information would probably be unnecessary) of undertaking a connectivity assessment of wells in the lower Tukituki that are between 40m and 50m deep. There needs to be good reason to impose regulation. Accordingly, POL TT11 (1)(a), will be amended by adding the words: "Wells in the lower Tukituki catchment (downstream of Red Bridge) screened between 40m and 50m are also exempt from this policy".

[551] The other matter concerns the methodology for assessing a well's connectivity to the surface water. POL TT11 1(b) provides an appropriate methodology by reference to the Canterbury Regional Council's guideline and to the 'Hunt' method. Mr Baker does not consider that the guidelines are appropriate. However we note they are not compulsory and are flexible as to the method used. No change is required.

Categorisation of consents and duration

[552] These matters are provided for in POL TT14.

"POL TT14 CONSENT CATEGORISATION AND DURATIONS

1. To manage the taking and use of surface water and groundwater in the Tukituki River catchment, so as to give effect to POL TT7 to POL TT13A, as follows:
 - (a) The taking of water allowed by section 14(3)(b) of the RMA shall continue to be allowed without further restriction under this Plan;
 - (b) From 4 May 2013 no new taking of surface water shall be allowed under Permitted Activity Rule 54;
 - (c) From 4 May 2013 the renewal of existing surface take consents, and the renewal of existing groundwater take consents within

²⁸¹ T Baker, Tukituki Catchment Proposal Hearing Transcript, pages 1887 and 1888.

²⁸² T Baker, Tukituki Catchment Proposal Hearing Transcript, page 1888.

Groundwater Allocation Zones 1 to 3, shall be a Restricted Discretionary Activity provided that the Table 5.9.4 or 5.9.5 Allocation Limits are not exceeded and the minimum flow regime is complied with. Renewed production land irrigation consents shall have durations not exceeding 20 years;

- (d) From 4 May 2013 the taking of water associated with a Community Irrigation Scheme involving an in-stream dam or any other in-stream dam shall be a Discretionary Activity under Rule 55 and if granted the consent duration should reflect the capital investment required and may be up to 35 years;
- (e) New takes within the Table 5.9.4, 5.9.5 or 5.9.6 Allocation Limits and complying with the minimum flow regime shall be a Discretionary Activity;
- (f) Outside Groundwater Allocation Zones 1 to 3 the renewal of existing groundwater take consents and the taking of new groundwater shall be a Discretionary Activity;
- (fa) Except as provided for in (a) to (f) above and (fb) below, takes (including those that do not comply with the minimum flow regime), shall be Non-complying Activities.
- (fb) From the date that Change 6 is made operative, take applications that would cause the Table 5.9.4, 5.9.5 or 5.9.6 allocation limits to be exceeded shall be a Prohibited Activity;
- (fc) For takes granted under (e) to (fa) above the consent duration shall be no more than 20 years;
- (g) Consent conditions shall be imposed that limit the instantaneous rate of take, the 28 day and seasonal volume of take for irrigation takes, and, except as provided for in POL TT9(1)(ba), the annual volume of take for non-irrigation takes;
- (h) Single resource consents may be granted to cover multiple uses of water.“

[553] Initially consent applications that did not comply with the allocation limits were non-complying. However EDS sought a prohibited activity classification for such applications²⁸³ on the basis that this was the only effective way of ensuring compliance with POL B5 of the NPSFM which requires regional councils to ensure that over-allocation is avoided. POL (fb) was inserted in to TT14 accordingly. In closing submissions counsel for Bel Group Limited questioned the use of the prohibited activity status in PC6 and went to the other end of the spectrum by suggesting that the appropriate classification was discretionary.

²⁸³ EDS legal submissions at page 36.

[554] In the Board's view an application to take water that does not comply with the PC6 allocation limits or minimum flows should not be either prohibited or discretionary. We consider that the additional tests for a non-complying activity (of a minor effect or not contrary to the plan) better suits the activity.

[555] The distinction between paragraphs 1(fa) and 1(fb) of POL TT14 as it currently stands is interesting. While failing to comply with the minimum flow regime in paragraph 1(fa) is a non-complying activity, exceeding allocation limits is a prohibited activity. We would have thought that non-compliance with the minimum flow regime would be just as significant as exceeding allocation limits.

[556] The main reason EDS sought to make consent applications that did not comply with the allocation limits in PC6 a prohibited activity was to ensure compliance with the NPSFM. Mr van Voorthuysen agreed with this view²⁸⁴ as did Mr St Clair and the other planners. The Board does not accept that view for two main reasons.

[557] First, any application for consent to take water that does not meet the allocation or minimum flow requirements of PC6 will have to be evaluated against the NPSFM as well as the RMA and other relevant high level documents. Making it a prohibited activity prevents any such application being evaluated. There may well be situations where minor, temporary, urgent or unique considerations justify consideration of an application for a non-complying activity.

[558] Secondly, it is highly significant that no activities involving water *quality* are categorised as prohibited activities, even though water quality (especially nuisance periphyton) is a major issue in the catchment. This reinforces the Board's view that applications concerning water quantity that do not comply with the provisions of PC6 ought to remain non-complying. Adequate protection for the plan provisions is provided by the pre-requisites of a non-complying activity (as the tests in s 104D of the RMA and the provisions of the NPSFM).

284 R van Voorthuysen, Evidence in Chief, paragraph 28.17.

[559] The necessary amendments will be achieved by amending POL TT14 (1)(fa) in the following way:

- (fa) Except as provided for in (a) to (f) above ~~and (fb) below,~~ takes (including those that do not comply with the minimum flow regime), shall be Non-complying Activities.

POL TT14(1)(fb) and rule TT6 will be deleted.

Water measuring and reporting requirements

[560] Although some irrigators commented on the cost of these requirements we were not given any substantive alternatives that would meet the HBRC's need to monitor and manage the water resource. We do not therefore, have any sound basis for altering the provisions as proposed by HBRC.

Community irrigation schemes

[561] A community irrigation scheme is defined in the glossary of PC6 as a 'water supply system that is capable of providing irrigation water to multiple production land properties and other ancillary uses'. Some submitters questioned why these schemes are not subject to the same rules as everyone else.

[562] Many policies within PC6 include specific provision for community irrigation schemes. These include TT6 (which relates to water quality), TT7, TT8, TT9, TT10, TT13, and TT14 (all of which relate to water quantity). Underlying these provisions is the philosophy that if consent is granted for such a scheme the effects will be controlled internally by way of conditions. But schemes are nevertheless subject to the relevant minimum flows and allocation limits in PC6.

[563] The Board does not see any justification for interfering with that policy.

Summary of conclusions on water quantity

[564] One of the purposes of PC6 is to maintain increased minimum flows in the rivers and streams for the purpose of safeguarding habitat which is used as the yardstick for protecting the wider environmental values in those water bodies. The minimum flows

proposed by HBRC give effect to NPSFM and are compatible with sustainable management under the RMA.

[565] Controls over the allocation of surface and groundwater go hand in hand with the minimum flow regime. While the NPSFM requires over-allocation to be avoided, it also requires the efficient allocation and efficient use of the water to be improved and maximised (Objective B3). We believe that as modified, both during the course of the inquiry process and as a result of this report, the allocation regime under PC6 will give effect to the NPSFM.

[566] Three particular changes should be mentioned: First, provision for rootstock protection should mitigate the more extreme effects of the new water allocation regime. Secondly, allocation of the tranche 2 resource on the basis that minimum flows will be preserved by the supplementation regime will enable greater access to that resource without adversely affecting instream values. Thirdly, the modification of the depth at which wells in the lower Tukituki will be exempt from the minimum flow regime should also enable more efficient utilisation of that water resource.

[567] Finally we note that while the availability of surface water has been limited by PC6, the potential availability of groundwater has been increased. This should encourage a switch from surface water takes to groundwater takes, which we believe is a sound policy. However, we do not see any necessity for any specific amendment to the policies or rules to reflect this factor.

Issue five — cultural matters

[568] Like consultation, cultural issues attracted considerable attention. The focus was on the likely impact of PC6 on the cultural values of tāngata whenua and, more specifically, upon the mauri (life force) of the waters in the Tukituki catchment.

The primary parties

[569] In the context of PC6 there were three distinct Māori parties:

- NKII — in opposition to the proposed plan change;

- The Heretaunga Parties (which we have collectively been referring to as Heretaunga): Te Taiwhenua o Heretaunga (TToH)²⁸⁵, Ngāti Hawea ki Matahiwi Marae²⁸⁶, Waimarama Marae²⁸⁷, Operation Patiki (Kohupatiki marae)²⁸⁸, Waipatu Marae (Ngāti Hawea, Ngāti Hori)²⁸⁹, Ruahapia Marae²⁹⁰, and Ngai Te Upokoiri ki Omahu Marae²⁹¹ — opposed to the proposed plan change; and
- Tamatea — in support of the proposed plan change.

To a greater or lesser extent the stance of these parties was supported or opposed by several other individuals and groups.

[570] NKII and Heretaunga oppose PC6 on a number of grounds, including²⁹²:

- inadequacy of consultation;
- insufficient evidence to support the proposition that the Tukituki catchment proposal, and in particular the proposed nutrient management regime, will safeguard the life-supporting capacity, ecosystem processes and indigenous species;
- insufficient evidence to support the proposition that water quality, water quantity and the ecological wellbeing of the waterways within the Tukituki catchment will be protected and enhanced;
- the proposed nutrient management regime is untested, highly contentious and based on the TRIM Model;
- PC6 does not contain any specific conditions for monitoring cultural values, including mauri, or make any provision for mana whenua to exercise their kaitiaki obligations.

²⁸⁵ Submission 67 on Tukituki Catchment Proposal.

²⁸⁶ Submission 379 on Tukituki Catchment Proposal.

²⁸⁷ Submission 196 on Tukituki Catchment Proposal.

²⁸⁸ Submission 252 on Tukituki Catchment Proposal.

²⁸⁹ Submission 395 on Tukituki Catchment Proposal.

²⁹⁰ Submission 342 on Tukituki Catchment Proposal.

²⁹¹ Submission 357 on Tukituki Catchment Proposal.

²⁹² NKII and the Heretaunga Parties, Opening submission, pages 10–11.

Of these matters we have already discussed consultation, water quality, and water quantity.

[571] The underlying values and concerns of the people of the lower Tukituki were reflected in the submissions of their counsel, representations presented at Matahiwi marae, and in the cultural values reports that are before the Board. Jamie Ferguson, counsel for NKII and the Heretaunga parties explained:

“..the matters of concern to Ngati Kahungunu through the Iwi Authority and the Heretaunga parties are not restricted to the cultural paradigm but extend across the four well-beings environmental, social, cultural and economic, which...were also capable of being embraced within the concept of mauri.”²⁹³

[572] Other issues mentioned by counsel included water quantity (levels and flows), water quality (nutrient management and nutrient loading), native fisheries, the state of the coastal estuarine environment, and the ‘fundamental’ issue of mauri.

[573] When closing for HBRC Mr Robinson suggested that the primary difference between HBRC and the Māori parties opposing the change came down to different approaches to nutrient management and different starting points.

Policy TT16

[574] This Policy evolved during the inquiry process as a result of concerns expressed by iwi witnesses, particularly with reference to the recognition of mana whenua rights and the restoration of the mauri of the river. It provides:

“POL TT16 IMPLEMENTATION PLAN

1. To give effect to the Regional Resource Management Plan provisions that apply within the Tukituki Catchment Hawke's Bay Regional Council will:
 - (a) by 31 December 2014, develop an overall Implementation Plan in collaboration with Iwi and Hapu and other affected or interested stakeholders;
 - (b) report on the achievement of the Implementation Plan outcomes on a 5 yearly basis through the Plan Effectiveness Report; and

²⁹³ J Ferguson, Tukituki Catchment Proposal Hearing Transcript, page 3327.

- (c) support the establishment of a multi-stakeholder group for the Tukituki Catchment for the purpose of developing the Implementation Plan and facilitating input into the development and delivery of specific implementation or monitoring projects and programmes.
- 2. The Implementation Plan will include (but not be limited to):
 - (a) a Regional Resource Management Plan effectiveness monitoring programme for the Tukituki Catchment;
 - (b) commissioning the monitoring and assessment of water quality, water quantity and freshwater, estuarine and coastal aquatic habitat environment matters and any other matters that reflect cultural interests and values, including kaitiakitanga and Mauri;
 - (c) the Tukituki Catchment Implementation Plan (draft April 2013);
 - (d) the matters addressed in POL TT4(2) and POL TT5(2); and²⁹⁴
 - (e) monitoring the adoption of industry good practices designed to achieve the industry good practice leaching rates required under POL TT4(1)(c)(ii).
- 3. To enable assessment and monitoring of the cultural values and Mauri of the Tukituki Catchment the Hawke's Bay Regional Council will:
 - (a) resource, subject to POL TT16(5), and assist Iwi and Tukituki hapu in the development of a mauri monitoring framework, including the use of wananga with relevant technical experts on at least the following:
 - i. Marine and coastal ecology;
 - ii. River ecology and fish passage;
 - iii. Water quality (e.g. nitrate/nitrogen) and quantity; and
 - iv. Monitoring methodologies (e.g. mauri model, CHI, State of the Takiwa);
 - (b) collaborate with Iwi and Tukituki hapu to develop and implement a monitoring programme that gives effect to the Mauri monitoring framework;
 - (c) Work with the iwi and Tukituki hapu to jointly report annually on the outcomes of the monitoring and any recommended actions to Hawke's Bay Regional Council; and
 - (d) Incorporate the outcomes on monitoring in the Plan Effectiveness Report.

²⁹⁴ The Board deleted 2(d) and (e) as a result of changes to the leaching provisions.

4. For the purposes of POL TT16, Hawke's Bay Regional Council collaboration with Iwi and Hapu will be based on tikanga Māori and an Engagement Plan to be developed in consultation with Te Taiwhenua o Tamatea, Te Taiwhenua o Heretaunga, Te Taiwhenua o Te Whanganui A Orotu and Ngati Kahungunu Iwi Incorporated. The Engagement Plan shall be finalised by 30 June 2014 and shall include a collective iwi/hapu management group
5. Hawke's Bay Regional Council will use its Annual Plan special consultative process to identify and commit the funding necessary to give effect to POL TT16(1) to (4) including the implementation of the Implementation Plan."

By the time the hearing finished there appeared to be relatively widespread support for this policy from the Māori submitters.

[575] Given the way the policy evolved, the Board has considered whether this new policy is within scope. We note that in part it reflects components of the Implementation Report drafted by Nathan Heath for HBRC.²⁹⁵ We also note that submissions relevant to this topic covered a very wide range of matters including cultural values, mauri, management by tāngata whenua, monitoring, and estuary/coastal matters.

[576] The Board is satisfied that the policy is within the scope. It now forms an important component of the PC6 cultural dimension.

The Board's findings

[577] The Board recognises the presence and tāngata whenua status of the iwi through NKII. It also recognises the presence and tāngata whenua status of the taiwhenua, marae and hapū of Heretaunga and Tamatea (and their ancestors) who dwell along the shores of the Tukituki River, its tributaries and streams.

[578] Having already addressed consultation, water quality and water quantity issues it remains for the Board to consider the impact of PC6 upon other aspects that are relevant to cultural values, including kaitiakitanga, mauri and mahinga kai. We will also consider the social and economic impact of PC6 upon Māori.

²⁹⁵ N Heath, Tukituki Catchment Implementation Plan, February 2013, Folder 1 of Plan Change application documents, Tab 4.

Kaitiakitanga

“Mā wai ra?” This question asks who are we doing this for, and as such portrays the past and future as equally important. The term ‘wai’ in te reo Māori is ancient and anchors people spiritually and physically in the realms of Ranginui and Papatuanuku, both in the past and in the future. The role of kaitiaki springs directly from the tūpuna with the understanding and duty to leave both realms with their mauri intact for future generations.”²⁹⁶

[579] Part 2 of the RMA provides for cultural considerations. Section 7(a) and (aa) require all persons exercising functions and powers under the RMA to have particular regard to kaitiakitanga and the ethic of stewardship. In the Tukituki River Catchment Values and Uses Report, June 2012, kaitiakitanga is described as:

“The act of guardianship although the translation does not fully express the depths and nuances of meaning inherent in the term. Mana whenua have an important responsibility as the kaitiaki of their ancestral lands, waters and other taonga to ensure the mauri of all living things is healthy and sustainable for future use.”²⁹⁷

Guardianship is exercised by the tāngata whenua in accordance with their tikanga Māori and the ethic of stewardship. The concept of kaitiakitanga requires tāngata whenua to be given an opportunity to exercise guardianship. Refer to *Minhinnick v Minister of Corrections*.²⁹⁸

[580] It was recognised by the High Court in *Friends and Community of Ngawha Inc v Minister of Corrections*²⁹⁹ (and upheld by the Court of Appeal³⁰⁰) that there can be primary kaitiaki and additional kaitiaki. Wild J observed that if the Court is to give effect to s 7(a) then it must first determine the identity of the kaitiaki. It is only the kaitiaki who can tell the Court what they consider kaitiakitanga requires.³⁰¹

[581] For its part Tamatea contends that it has primary kaitiaki with respect to the headwaters of the Makaroro, Waipawa and Tukituki Rivers. Mr Gordon explained:

²⁹⁶ Te Manaaki Taiao, Te Taiwhenua o Heretaunga, Cultural Values and Uses of the Tukituki Catchment, May 2012, page 19 (supplementary appendix to M Apatu’s Evidence in Chief).

²⁹⁷ Te Taiwhenua o Tamatea in partnership with Te Taiwhenua o Heretaunga, Tukituki River Catchment Values and Uses, June 2012, Folder 2 of Plan Change application documents, Tab 5, page 22 – See also the definition in s 2 of the Resource Management Act.

²⁹⁸ *Minhinnick v Minister of Corrections*, NZEnvC Akld, ENC Auckland A043/2004, 6 April 2004, at [132].

²⁹⁹ *Friends and Community of Ngawha Inc v Minister of Corrections*, [2002] NZRMA 401,

³⁰⁰ *Friends and Community of Ngawha Inc v Minister of Corrections*, [2003] NZRMA 272 (CA)

³⁰¹ at [70].

“The concept of primary kaitiaki may seem quite abstract but the concept manifests itself in everything Tamatea does. It is a reality. Tamatea is involved in resource consent processes that include abstraction of water and discharges to water and for works in riverbeds and the extraction of gravels.”³⁰²

On the other hand, Heretaunga asserts primary kaitiakitanga in relation to the lower reaches of the Tukituki River (while emphasising that it is necessary to take a holistic approach to the river).

[582] Generally the Courts are reluctant to enter the fray of determining status or mandate (*Te Pairi v Gisborne District Council*³⁰³) and the Board do not find it necessary to do so in this case. Tamatea and Heretaunga were *jointly* involved in the preparation of the *Tukituki River Catchment Values and Uses* Report of June 2012 with the aim of clarifying and defining key Māori environmental cultural values and their application within the Tukituki River Catchment”.³⁰⁴ It found:

“The mauri life force of the Tukituki River catchment is interwoven and integral to the spiritual and physical health of the people – any impacts or harm impacting on the mauri negatively affects the health of the people.”³⁰⁵

The report adopted a holistic approach to the catchment and it would be wrong for the Board to adopt a different approach. We believe the views of *both* Heretaunga and Tamatea are entitled to great respect.

[583] PC6 must, of course, give effect to the NPSFM which includes a section on tāngata whenua roles and interests:

“Objective D1

To provide for the involvement of iwi and hapu, and to ensure that tangata whenua values and interests are identified and reflected in the management of fresh water including associated ecosystems, and decision-making regarding freshwater planning, including on how all other objectives of this national policy statement are given effect to.

³⁰² I Gordon, *Te Taiwhenua o Tamatea*, Opening legal submission, paragraph 46.

³⁰³ *Te Pairi v Gisborne District Council*, NZEnvC Wellington, W093/04, 22 December 2004, at [41].

³⁰⁴ *Te Taiwhenua o Tamatea* in partnership with *Te Taiwhenua o Heretaunga*, *Tukituki River Catchment Values and Uses*, June 2012, , page 79.

Policy D1

Local authorities shall take reasonable steps to:

- a) involve iwi and hapu in the management of fresh water and freshwater ecosystems in the region
- b) work with iwi and hapu to identify tangata whenua values and interests in fresh water and freshwater ecosystems in the region and
- c) reflect tangata whenua values and interests in the management of, and decision-making regarding fresh water and freshwater ecosystems in the region.”

Dr Te Kipa Morgan, an expert witness for NKII and Heretaunga, noted that contrary to this objective and policy there was virtually no reference in PC6 (as notified) to cultural matters.³⁰⁶

[584] In addition Dr Morgan made reference to Policy 2(f) of the New Zealand Coastal Policy Statement 2010 which requires local authorities to provide opportunities for tāngata whenua to exercise kaitiakitanga over waters in the coastal environment through such things as monitoring and management.³⁰⁷ He claimed that HBRC had not sought to engage with the marae or hapū in the lower Tukituki (including the coastal environment) about the effects of PC6 on cultural values.

[585] Mr van Voorthuysen acknowledged that there were very few specific references to cultural matters in PC6 as notified. Clearly PC6 was deficient in this respect. However, the Board believes that this deficiency has been overcome by POL TT16 which provides a framework for ongoing participation and active kaitiaki. In this way Māori participants will be able to provide for their kaitiakitanga within the catchment with the support of PC6.

Mahinga Kai

[586] The Tukituki River Catchment Values and Uses Report, June 2012, states:³⁰⁸

³⁰⁶ T Morgan, Tukituki Catchment Proposal Hearing Transcript, page 3045.

³⁰⁷ T Morgan, Tukituki Catchment Proposal Hearing Transcript, page 3046.

³⁰⁸ Te Taiwhenua o Tamatea in partnership with Te Taiwhenua o Heretaunga, Tukituki River Catchment Values and Uses, June 2012, Folder 2 of Plan Change application documents, Tab 5, page 25.

“Many of the ecosystems are irreplaceable and their sustainability is vital to the over-all health state of mahinga kai resources within the Tukituki River catchment. Historically, the Tukituki catchment had an abundance of mahinga kai resources...”

Later³⁰⁹ the report provides a table which explains the relationship between instream values and flows/water quality in various parts of the catchment, including the values of mahinga kai species. Restoration of habitat was seen as an important priority.³¹⁰

[587] A few months earlier the Tukituki Choices consultation discussion document had considered river values from a Māori perspective. With reference to mahinga kai the report noted:³¹¹

“Mahinga Kai is supported by minimum flows which provide habitat for different species. All scenarios provide for 90% habitat for longfin eel.”

Mahinga kai was addressed with reference to four possible future scenarios (two with a storage scheme and two without) and in each case the outcome for mahinga kai quality and availability was rated ‘very good’.

[588] The Board has already confirmed minimum flows at a level that will provide 90% habitat protection (except for below Red Bridge). Compared with the current situation this represents a significant increase in habitat protection which should significantly improve mahinga kai within the catchment.

Mauri

[589] Both a river and the 'mauri' or 'life-force' provided by that river can constitute taonga in their own rights. Māori attitudes towards water bodies are part of our nation's jurisprudence, with the Privy Council having stated in *New Zealand Māori Council v Attorney-General*:³¹²

³⁰⁹ Te Taiwhenua o Tamatea in partnership with Te Taiwhenua o Heretaunga, Tukituki River Catchment Values and Uses, June 2012, Folder 2 of Plan Change application documents, Tab 5, page 30, Table 3.0 – Relationship values with flows and water quality.

³¹⁰ Te Taiwhenua o Tamatea in partnership with Te Taiwhenua o Heretaunga, Tukituki River Catchment Values and Uses, June 2012, Folder 2 of Plan Change application documents, Tab 5, page 75.

³¹¹ Tukituki Choices –a discussion of choices and opportunity for land and water management, September 2012, page 27 (Table headed ‘A Look at River Values from a Māori Perspective’).

³¹² *New Zealand Māori Council v Attorney-General*, PC, [1993] 1 NZLR 513 (PC).

“Rivers and other water bodies could be living beings or ancestors. In whakapapa, Māori had kin relationships with these water bodies. Each had its own mauri (life force), its taniwha (spirit guardians), and a central place in tribal identity. And access was jealously guarded and controlled. Travelling by waka, fishing, or other forms of use were only by permission of the tribe which held mana over those waters. The importance of these water bodies to Māori cannot be overstated. These things have long been known.”

By the same token it has been held that while the relationship between Māori and water should be given particular weight, it does not amount to a veto.³¹³

[590] In the Tukituki River Catchment Values and Uses Report, June 2012, an improvement to the mauri of all waterways was seen as a critical outcome. The report explains:

“Mauri is the life essence of nature itself on this planet” Hodges (1992). When mauri is extinguished within a species the result is extinction because the natural restorative and regenerative powers are lost. Of absolute importance to Ngāti Kahungunu Iwi is the preservation and protection of mauri. Ensuring the preservation and protection of mauri is to provide for conservation of biodiversity. The outcome will ensure the restoration and regeneration of ecosystems.”³¹⁴

Specific factors for assessing mauri include water quality (colour, temperature and depth), flora and fauna (abundance of plant and animal life including specific native species), and evidence of pollution and sewage.³¹⁵

[591] Finally, while discussing the concept of mauri, we repeat an observation made by Ms Codlin on behalf of HBRC:³¹⁶

“Mauri is an important concept for tangata whenua but in order to provide meaningful guidance to decision-makers, this sub-objective relates to aspects of water quality and quantity that contribute to mauri. Elements of water flow and quality that relate to mauri were identified in the Tukituki River Catchment Values and Uses Report³⁴ prepared jointly by Te Taiwhenua o Tamatea and Te Taiwhenua o Heretaunga as including natural character, flow variability, natural energy, rainfall, aquifer recharge, flushing flows, flows for fish habitat, changing flow paths, flooding or exposing waahi tapu.”³¹⁷

³¹³ *Ngati Rangi Trust v Genesis Power Ltd*, [2009] NZRMA 312, , page 317.

³¹⁴ Te Taiwhenua o Tamatea in partnership with Te Taiwhenua o Heretaunga, Tukituki River Catchment Values and Uses, June 2012, Folder 2 of Plan Change application documents, Tab 5, page 28.

³¹⁵ Te Taiwhenua o Tamatea in partnership with Te Taiwhenua o Heretaunga, Tukituki River Catchment Values and Uses, June 2012, Folder 2 of Plan Change application documents, Tab 5, page 76, Table 6.0 – Factors for assessing mauri.

³¹⁶ H Codlin, Evidence in Chief, paragraph 11.31.

³¹⁷ H Codlin, Evidence in Chief, paragraph 11.31.

Ms Codlin also noted that OBJ TT1(e) required the waters in the catchment to be managed in a way that will contribute to healthy mauri.

[592] Now we turn to the relief sought by NKII and Heretaunga. In one respect this reflects a recommendation in the Cultural Values and Uses of the Tukituki Catchment Report, May 2012:

“A Heretaunga hapū ‘Waipureku to Red Bridge’ mauri-based river strategy be initiated and implemented in partnership with Hawke’s Bay Regional Council. This to be inclusive of a whole-of-takiwā gravel extraction plan, species monitoring, mahinga kai protection, and so on.”³¹⁸

The way in which such a strategy could be initiated and implemented was explained by Dr Morgan with reference to his ‘mauri model’.

[593] Dr Morgan told the Board:³¹⁹

“The mauri model decision making framework has not been used by Hawkes Bay Regional Council in respect of the Ruataniwha Water Storage Scheme or PC6 and nor has the applicant evaluated their own proposal using the framework.

Based on the preliminary analysis it is clear that while there are short time realizable economic incentives and long term there will be some social incentives for the proposal, the mauri of the cultural and environmental dimensions are unlikely to be enhanced.

This emphasises the significant risk that a decision made at this time will neither be fully informed nor will it be equitable to all parties. Until a more comprehensive holistic analysis of the Tukituki Catchment Proposal is conducted the actual impacts of this undertaking will not be adequately understood.”

Dr Morgan concluded by saying that enhancing the mauri of the Tukituki River should be the focus and PC6 failed to achieve that.

[594] When closing for HBRC Mr Robinson suggested that the Board should approach Dr Morgan’s model in the same way as the Bay of Plenty Hearing Committee had when

³¹⁸ Te Manaaki Taiao, Te Taiwhenua o Heretaunga, Cultural Values and Uses of the Tukituki Catchment, May 2012, page 28 (supplementary appendix to M Apatu’s Evidence in Chief).

³¹⁹ T Morgan, Tukituki Catchment Proposal Hearing Transcript, page 3140.

considering a resource consent application for setting levels for Lake Rotorua and Lake Rotoiti. The hearing committee focused on the performance indicators rather than the judgements that Dr Morgan had fed into the model and the outputs from it.³²⁰ We agree.

[595] Policy TT16 expressly provides for the assessment and monitoring of the mauri of the Tukituki catchment and iwi/hapū will be involved in developing and implementing the programme. HBRC will commit the necessary funding. The Board supports these initiatives. It is also confident that the dual nutrient approach and minimum flow regime that are to be implemented will improve water quality which should in turn assist in enhancing the mauri of the waters within the catchment.

Native fisheries

[596] The Tukituki River Catchment Values and Uses Report, June 2012, states:³²¹

“Habitat degradation is a major concern for marae and hapū who have expressed a strong desire to reassert their mana over freshwater fisheries, especially in the harvesting of eels.”

There are many native fish species in the Tukituki River and some of these species are considered to be at risk.³²²

[597] Mr Apatu, Margaret McGuire and Tom Mulligan (on behalf of NKII and Heretaunga) all gave evidence about the diminishing population of native fish in the lower Tukituki. They also observed that the quality and size of mahinga kai and taonga, including native fish species, are declining. Mr Apatu told us that despite these trends there are no proposals to mitigate or monitor conditions regarding wildlife at risk, particularly in the lower Tukituki region.³²³

[598] HBRC acknowledged these concerns. However, the steps that are being taken to address them, particularly fish passage, focus on the RWSS and we will defer discussion of that aspect until Part 3.

³²⁰ HBRC and HBRIC, Closing submissions, paragraphs 545–548.

³²¹ Te Taiwhenua o Tamatea in partnership with Te Taiwhenua o Heretaunga, Tukituki River Catchment Values and Uses, June 2012, page 48.

³²² M Apatu, Tukituki Catchment Proposal Hearing Transcript, page 3211.

³²³ M Apatu, Tukituki Catchment Proposal Hearing Transcript, page 3211.

[599] For present purposes the Board accepts that PC6 should alleviate many of the concerns that have been expressed. Decisions already made in relation to water quality and quantity should improve the habitat of native fisheries in the lower catchment and POL TT16 will enable progress to be monitored.

Social and Economic

[600] The Tukituki River is a focus for the social and economic vision and lives of the whanau and hapū who associate with it. The Board heard many stories about past and present lives spent enjoying the river and utilizing its resources.³²⁴ To a large extent these opportunities revolve around preservation and enhancement of the mauri of the river. Any further decline is seen as untenable.

[601] The Board believes that the tighter nutrient management and higher minimum flows under PC6 will lead to a significant improvement in the quality of the water in the lower catchment. This should enable future generations to enjoy the social and economic opportunities that were experienced by past generations.

A concluding finding about cultural matters.

[602] Three recommendations were made to HBRC in the Tukituki River Catchment Values and Uses Report, June 2013.³²⁵

- mana whenua to have greater participation in decision-making at governance, management and operational levels of regional planning;
- a more consistent planning approach towards improving the mauri of the catchment;
- HBRC to work alongside marae/hapū in identifying existing and potential measures towards protecting wahi tapu and cultural sites of importance to mana whenua.³²⁶

³²⁴ See M McGuire and T Mulligan representations on Day 25 of Hearing (15 January 2014) and M Apatu and N Huata representations on Day 26 of Hearing (16 January 2014) as examples.

³²⁵ Te Taiwhenua o Tamatea in partnership with Te Taiwhenua o Heretaunga, Tukituki River Catchment Values and Uses, June 2012, Folder 2 of Plan Change application documents, Tab 5, page 78.

While PC6 might not go as far as the tāngata whenua would have wished, the Board is satisfied that the provisions of PC6 as amended will enable the tāngata whenua of the catchment to provide for their cultural well-being.

Issue six — freshwater and terrestrial ecology

[603] All communities wish to maintain and improve the quality of freshwater in their region. OBJ TT1(a) requires the catchment to be managed so that river flows are enhanced and water quality is maintained and improved. One of the underlying goals is the improved health of aquatic ecosystems, macro invertebrates, native fish and trout.

[604] Part 2 of the RMA makes specific reference to such matters. The definition of sustainable management under 5(2)(b) includes the safeguarding of life supporting capacity of ecosystems. Those exercising powers are required by s 6(c) to recognise and provide for the protection of significant indigenous vegetation and significant habitats of indigenous fauna. And under s 7(d) and (h) those exercising powers under the RMA are required to have particular regard to the intrinsic values of ecosystems and the protection of the habitat of trout and salmon.

The evidence

[605] In a 2013 report³²⁷ Ms Codlin identified the ecological values of the catchment as healthy ecosystems — life supporting capacity, biodiversity, native fish habitats, trout habitats, and fish passage. Given those values Ms Codlin proposed the following freshwater objectives for the water management zones³²⁸.

- “(i) Migrating whitebait, trout fishery and contact recreation in the lower Tukituki River (Zone 1);
- (ii) Maintaining existing periphyton levels and providing for spawning and developing trout fry and fingerlings in the upper Tukituki/Waipawa rivers and the headwater streams (Zone 4);
- (iii) The provision of adult trout and adult native fish habitat in the streams on the Ruataniwha Plains and providing for trout and native fish spawning (Zones 2 and 3);

³²⁶ This matter is relevant to the RWSS and will be referred to in Part 3.

³²⁷ H Codlin, Tukituki Catchment Freshwater Management Objectives, February (Codlin), 2013, Folder 2 of Plan Change application documents, Tab 3, at page 4.

³²⁸ Shown in Figure 3 at paragraph [145] above.

- (iv) Provision of native fish habitat for Papanui Stream (Zone 5)
- (v) Maintaining the viability of aquatic invertebrates, particularly over the warmer months, in streams supporting significant populations of native fish and rainbow trout (all zones)."

Freshwater objectives that were to apply across the whole of the catchment included mauri, life-supporting capacity, contact recreation, water use and fish passage.

[606] Timothy Sharp, a Strategic Policy Advisor at HBRC, explained³²⁹ the methodology that was used to assess freshwater values which enabled the objectives policies and rules in PC6 to be developed. Mr Sharp assessed various freshwater values including trout, trout spawning habitat, inanga, inanga spawning habitat, and native fish habitat.

[607] A Senior Resource Analyst for HBRC, Fiona Cameron, was the author of the report Identifying Native Fish Values Tukituki River Catchment, which stated:³³⁰

"Effective management of fish populations is dependent on knowledge of the presence of fish species and their critical habitat requirements within a catchment. This knowledge helps to identify species distributions, to assess values and identify possible pressures on freshwater fish communities.....

An analysis of the New Zealand Freshwater Fish database identified fifteen species in the Tukituki River and its tributaries. Of these species, seven are listed as chronically threatened and declining.

Key outcomes include:

1. The most flow dependent freshwater fish species identified in the Tukituki River catchment are the Longfin eel, Torrentfish, Koaro and Rainbow trout.
2. Dwarf galaxiid is the only threatened non-migratory species in the catchment and is localised to the rivers draining the foothills of the Ruahine and Kaweka ranges. Its restricted range in Hawke's Bay further emphasises its threatened status in the region.
3. The habitat requirements for fish species may be determined on a reach by reach or sub-catchment by sub-catchment basis, assuming that

³²⁹ T Sharp, Tukituki Catchment, Freshwater Values Assessment, March 2012, Folder 2 of Plan Change application documents, Tab 1, Section 1.2.

³³⁰ F Cameron, Report: Identifying Native Fish Values, September 2012, Folder 2 of Plan Change application documents, Tab 2, Executive Summary, page i.

the flow requirements for the most sensitive species will satisfy the requirements for all other less demanding species.

Seventeen management zones have been defined for the Tukituki River catchment.

a. Longfin eel was identified as the species likely to be most widespread in all seventeen catchments;

b. Dwarf galaxiid was identified as a key threatened species in five of the catchments (T1, T5, T6, T8, and T15). This species does not require a large flow to ensure habitat protection and will be protected by setting low flow limits for the species with higher flow requirements.

c. Torrentfish was identified as a key species in nine of the seventeen catchments

d. Rainbow trout was identified as a key species in seven of the seventeen catchments

e. Crans bully was identified to be the most widespread non-migratory species in the Tukituki and was likely to be present in twelve of the seventeen catchments.”

Some of these values are not supported by the expert witnesses engaged by other submitters. For example, Dr Kelvin Lloyd (on behalf of Te Taiao Hawke’s Bay Environmental Forum) and Ms McArthur took issue with some of the values. However, these differences are not critical to the conclusions the Board has reached on this topic.

The Board’s findings

[608] Good water quality is an essential value for freshwater ecosystems as it enables aquatic life such as fish and macro invertebrates to survive and reproduce. Generally the main water quality characteristics that need to be considered when assessing surface water quality in a waterway are nutrients (which influence the growth of algae and cyanobacteria), water clarity (which influences fish feeding), water temperature (which can be too warm for some species) and dissolved oxygen (which can be too low for sensitive species). Particularly high concentrations of some nutrients (e.g. ammonia and nitrate) can also be toxic to aquatic life.³³¹

³³¹ Cawthron Institute, Ruataniwha Water Storage Scheme – Aquatic Ecology Assessment of Effects, Cawthron (May 2013, Ruataniwha Water Storage Scheme application documents, Key Reference Report, Folder 5, Tab 3, page 20.)

[609] PC6 is intended to provide an integrated approach to the management of land use and water. Amongst other things it contains a minimum flow regime that is designed to sustain river ecosystems and instream values. Improved quality as a result of the nutrient approach in the plan will also sustain these values. The Board is satisfied that PC6 appropriately addresses freshwater ecology, meets the statutory provisions in Part 2 of the RMA, and also gives effect to the NPSFM.

[610] Up to this point we have been focusing on *freshwater* ecology. PC6 does not contain any policies objectives or rules specifically relating to *terrestrial* ecology. While the issue of terrestrial ecology has been raised by many submitters, it is in the context of the RWSS rather than PC6. For that reason we will leave consideration of terrestrial ecology until we consider the RWSS in Part 3. Suffice to say that the Board does not consider that any specific policies or rules relating to terrestrial ecology need to be added to PC6.

Issue seven — amenity, recreational and social values

[611] Amenity, recreational and social values can mean different things to different people. Amenity values are defined in s 2 of 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.”

In practice amenity values are commonly considered in terms of scenic quality, recreational fisheries, and other types of recreation. Social values tend to focus on the interaction between people.

[612] One of the purposes of PC6 is to maintain the amenity and recreational values of fresh water. Under OBJ TT1 this is to be achieved by enabling safe contact recreation in the freshwater within the catchment and managing excessive periphyton growth. POL TT1 also includes water quality measures that are directly relevant to recreational and amenity values (for example, periphyton bio mass limits and targets, water clarity).

[613] There is an expectation that the community will have free and unrestricted access to our rivers. The social values that attach to amenity and recreation include

swimming, fishing, boating, white water kayaking, walking, passive enjoyment, food gathering, public access and lifestyle.

The evidence

[614] With reference to social values and uses the s 32 Evaluation Report states:³³²

“Social values and uses of the Tukituki River Catchment identified in the Tukituki Choices discussion document included: human and stock drinking, swimming and fishing, passive enjoyment, food gathering, public access and lifestyle.

The urban and rural communities rely on groundwater and surface water for domestic and stock drinking water supplies. Only Waipawa, Waipukurau, Takapau and Haumoana communities within the Tukituki catchment are provided with reticulated municipal water supplies; other communities, lifestyle blocks and farms rely on rainwater, surface water and/or groundwater to meet domestic and stock drinking needs.

The Tukituki River is of regional significance as a trout angling river. The river is one of the two most heavily fished rivers in the North Island, the sixth most popular trout fishing river in New Zealand and the equal tenth most popular after taking into account both trout and salmon angling. The Tukituki River accounts for over 80% of angling within the Tukituki catchment and is a prime example of a heavily used lowland or recreational fishery. It is highly valued by Hawke’s Bay anglers, primarily for its proximity to population centres, its ease of access and its suitability for a wide range of family based activities (Unwin, 2012).”

The report also notes that some additional values were identified after the Tukituki Choices document was released. These included the ‘high quality’ experience of recreating within the Tukituki River and the ‘resilient’ landscape.

[615] The 2000 ANZECC guidelines define three categories of water-related recreational activities, based on the frequency and intensity of body contact with the water. HBRC has accepted that the ‘primary contact’, ‘secondary contact’ and ‘visual use’ categories are all relevant to the delineation of the recreation value and they have been used in formulating PC6.³³³

³³² H Codlin and R van Voorthuysen, Section 32 Evaluation Summary Report for proposed Plan Change 6 Tukituki River Catchment, adopted by council on 24 April 2013, Folder 1 of Plan Change application documents, Tab 3, report, paragraph 6.2.

³³³ T Sharp, Tukituki Catchment Freshwater Values Assessment, March 2012, Folder 2 of Plan Change application documents, Tab 1, page 3.

[616] A number of witnesses expressed concern about the deterioration of the river water quality and its effects on recreational opportunities. This was generally linked to concerns about land use intensification. We heard evidence and saw many photographs concerning the current degraded state of some of the reaches of the river.

[617] Charles Taylor, a consultant and researcher in the field of applied social research and social assessment, provided an overview of these matters on behalf of HBRC:³³⁴

“... [6 submitters] have all raised the issue of negative social impacts and request that the Plan Change and RWSS consents be refused. These submitters raise questions about potential changes in the community fabric of the affected areas as a result of agricultural intensification (in some submissions referred to as industrialisation) and associated changes in land ownership, employment and work practices. Particular mention is made to increases in ‘casual’, ‘seasonal’ or ‘migrant’ labour (C Perley, P Elliot).”

Although Mr Taylor accepted that intensification would result in a number of community changes, he did not accept that changes to employment patterns or the composition of communities are inherently an adverse effect. As he saw it, community change needed to be anticipated and managed.

[618] Mr van Voorthuysen responded to a call for the policies to be expanded to cover such things as social values:³³⁵

“Some submitters seek that POL TT1 be expanded to state that the water quality limits and targets have been set “in the context of environmental, economic, social and cultural values” and that they are based on “community objectives”. I do not support that suggestion. Those process matters are more appropriately included in the Section 32 Report and in any event they duplicate matters already addressed in the Change 6 objectives. As I noted in response to Dairy NZ’s submission on the objectives, the style of Change 6 is deliberately minimalist and is restricted to the three matters listed in section 67(1) of the RMA. POL TT1 is a statement of the water quality limits that have been chosen (a statement of action) to implement the Change 6 objectives and in my view the amendments sought do not improve the policy in that regard.”

³³⁴ C Taylor, Evidence in Chief, evidence at paragraph 3.2

³³⁵ R van Voorthuysen, Evidence in Chief, paragraph 10.5. The submitters are Federated Farmers of New Zealand and Hawke’s Bay Deer Farmer’s Association.

The Board's findings

[619] In order to maximise amenity and recreational values it is important that the waters of the rivers and streams are as clean and clear as possible, beds are as free as possible from slime and algae, and the riparian ecology is sound and healthy. Unfortunately, over time the waterways within the catchment have degraded and it is clear that human activity has played a role in that state of affairs.

[620] The Board accepts that many of the concerns raised by submitters are justified. Water standards need to be set that will return the waters of the middle and lower catchment to a condition where swimming and other recreational pursuits can be enjoyed.

[621] As a trout angling river the Tukituki River is of regional significance and in the lower reaches the river provides food gathering opportunities and a native fishery. To maintain and enhance these recreational values it is important to ensure that there are healthy ecosystems, life supporting capacities, biodiversity, native fish habits, trout habits and fish passage. Critical fish species include longfin eel, inanga, whitebait and trout.

[622] When it comes to restoring the waters in the catchment so that amenity, recreational and social values can be achieved three objectives within PC6 are particularly significant. OBJ TT1(a) sets a goal of achieving water quality that will enable safe contact recreation and food gathering. OBJ TT1(b) seeks to reduce excessive periphyton. And OBJ TT2 requires water that has been degraded by human activities to be improved over time.

[623] Those objectives will be implemented through the dual nutrient approach to the management of water quality and the setting of minimum flows. One of the primary goals of these policies is to reduce excessive periphyton which is an anathema to swimmers. The Board is confident that these steps will enhance amenity, recreational and social values within the middle and lower catchment.

Issue eight — public health

[624] The public health of communities can be affected by the quality of the water they drink or in which they recreate. PC6 seeks to manage water quality in the catchment so that it is safe for both domestic consumption and recreation.

[625] Under the Public Health Act 1956 a register of drinking water is required. The Resource Management (National Environmental Standards for Sources of Human Drinking Water) Regulations 2007 (NESDWS) controls the rules that a regional council can include in its plan if those rules have the potential to affect a registered drinking water supply that provides no fewer than 501 people with drinking water for not less than 60 days each calendar year. Maximum allowable concentrations of potentially harmful contaminants that may be present in water are prescribed by the Drinking Water Standards for New Zealand 2005 (DWSNZ).³³⁶

[626] Within the Tukituki catchment CHDBC has four registered water supplies and HDC has one. All bores are monitored and the current concentrations of nitrate nitrogen are below detection limits. The maximum limit to ensure compliance with DWSNZ standard is 11.3mg/L nitrate nitrogen.

[627] Monitoring of groundwater in the Ruataniwha Basin between 2007 and 2012 indicates that the groundwater is generally suitable for potable use. However, monitoring of shallow groundwater in 2008 and 2012 revealed that although the concentration of nitrate nitrogen was generally well within the drinking water standards, there were two localised sites where concentrations of nitrate nitrogen exceeded those standards. But the report concluded that there was little risk of these standards being exceeded unless land use “intensifies dramatically and land management practices allow significant leaching of nitrate-N to groundwater”.³³⁷

[628] Many submitters raised the issue of land use intensification. To a large extent these concerns have already been addressed when we considered water quality and quantity. Nevertheless it is helpful to briefly mention some of the provisions of PC6

³³⁶ Revised in 2008.

³³⁷ D Gordon, Ruataniwha Groundwater Quality – State and Trends, February 2013, Gordon & Ors at page i.

that are specifically directed towards public health. OBJ TT1(b) and (ba) require the catchment to be managed so that there are safe and reliable human drinking water supplies and contact recreation. POL TT1 requires point source discharges and the use of production land upstream of a registered drinking water supply to be managed so that the surface water complies with the NESDWS and DWSNZ. Similar provision is made in POL TT2 in relation to groundwater. And the E. coli standards in Table 5.9 1A are set at a level that will enable contact recreation during summer³³⁸.

[629] Dr Jones presented a helpful representation on behalf of HBDHB. Apart from a suggested amendment to OBJ TT1(ba) which we have already adopted,³³⁹ Dr Jones proposed several other amendments which we have considered. In the end the Board decided that these amendments were not necessary.

[630] Overall the Board is satisfied that PC6 is consistent with, and complementary to, existing statutory provisions, standards and regulations supporting public health.

Issue nine — economics

[631] The Board must consider whether in terms of s 5(2) of the RMA PC6 will enable the people and communities within the catchment (and beyond) to provide for their economic well-being (while meeting the other requirements that are specified in the subsection). Much of the evidence on this matter was directed at the RWSS and will accordingly be discussed in Part 3. With respect to PC6 the core economic concerns relate first to the availability of water for crops and livestock and secondly to the implications of any nutrient management regime that is adopted.

The evidence

[632] For the applicants the primary evidence about economic effects was provided by Mr Macfarlane. Although MRB were commissioned to prepare a report about the RWSS two observations he made are particularly relevant to PC6:

- high water reliability is an essential component of not just on farm economics, but water use efficiency, hence drainage and nitrogen losses;

³³⁸ That table can be found at paragraph [305] above.

³³⁹ See paragraph [268] above.

- The farm system model will respond to environmental outcomes required in a multitude of ways, depending on the farm locality, soil type and objectives.

Mr Macfarlane considered that environmental mitigation strategies could be integrated into the farming system and that while there would be an “ebb and flow of land use in tandem with economic cycles” the Ruataniwha Plains would remain a mixed land use area.³⁴⁰

[633] Another economist, Simon Harris, also gave evidence for HBRC. He discussed the implications for the local economy of a reduction in the reliability of the water supply, Schedule XVIII as notified, and a DIN limit of between 0.3 mg/l and 0.15 mg/l. Mr Harris concluded that these matters, particularly DIN limits at those levels, would have very severe impacts on land use in the catchment and could result in large scale reversion to forestry or conservation land³⁴¹.

[634] Dr Adolf Stroombergen gave evidence for Mr Apple. He quantified the economic losses that would arise from PC6 in its notified form, in particular minimum flows, seasonal water restrictions, and the absence of any provision for rootstock protection. Dr Stroombergen concluded that the financial viability of orcharding would be threatened although this might be ameliorated to some extent if PC6 was amended³⁴².

[635] We have already mentioned another economist, Mr Ford, when discussing water quantity. Following changes to PC6 Mr Ford’s concerns were partially allayed, although he still considered that the minimum flow regime was too harsh on the horticulture sector.

[636] Although she is not an economist it is also appropriate to make further reference to the evidence of Dr Dewes. She told us:³⁴³

“Business needs certainty. Therefore fair and equitable allocation of ecosystem services and diffuse loss rights to farmers at the outset is critical to success of any new project. This way farms can design their 30 farm systems knowing

³⁴⁰ A Macfarlane, Evidence in Chief, paragraph 2.5 (j).

³⁴¹ S Harris, Evidence in Chief, paragraph 2.4.

³⁴² A Stroombergen, Evidence in Chief, paragraph 10.11.

³⁴³ A Dewes, Concise Summary, at paragraphs 4 and 5.

their limitations rather than being surprised by a policy change at a later date when ecosystem services become over allocated and require ‘clawback’ policies. This results in immense social and financial stress for farmers as they are faced with unexpected change.

...

Growth needs to be economically, environmentally and socially sustainable. New agricultural development must be based on business plans that reflect reality and are able to withstand climatic, resource and price volatility. It is therefore essential that resource allocation is also clearly defined at the outset and businesses are clear on the limits they need to operate within.”

The Board’s findings

[637] Arriving at ‘sustainable management’ as defined in s 5(2) of the RMA involves a balancing of interests. On the one hand we have environmental considerations and on the other the economic well-being of the people and communities that are affected.

[638] In *Environmental Defence Society Incorporated v New Zealand King Salmon Company Ltd*³⁴⁴ the High Court considered this type of balancing:

“The balancing of the interests to be reflected in the concept of “sustainable management” as defined in s 5(2) of the RMA is not narrowly defined. As always, context will be relevant to its application. In the context of this proposed plan change, one form of balancing predictably undertaken was between the economic and social advancement of the affected communities from increased salmon farming activities, and the extent of adverse effects that activity might involve on the natural and physical attributes of the Sounds. This evaluation is contemplated by s 5(2) in giving effect to the principle of sustainable management.”

Dobson J concluded that the New Zealand King Salmon Board of Inquiry had not erred when it talked about a balance “between” providing for the social and economic well-being of the community and achieving sustainable management of the natural and physical resources of the Marlborough Sounds.

[639] In the context of PC6 there is an overriding requirement to give effect to the NPSFM. Amongst other things this requires the Board to set water quality limits and

³⁴⁴ *Environmental Defence Society Incorporated v New Zealand King Salmon Company Ltd*, HC Blenheim, CIV–2013–406–56, 8 August 2013, Dobson J, at [89].

environmental flows which by definition in the Policy Statement includes both allocation limits and minimum flows. The Policy Statement also requires an “integrated management” approach. Inevitably these requirements give rise to a tension between environmental and economic considerations.

[640] From the time that PC6 was notified these tensions have received close scrutiny, initially in the submissions and later as the inquiry progressed. In some respects environmental considerations have tended to prevail. For example, in the approach to nutrient management and minimum flows. In other respects economic considerations have tended to prevail. Examples are: abandonment of the ‘sinking lid’ approach, re-writing of Schedule XVIII, provision for rootstock and crop protection, and greater access to the Ruataniwha aquifer (provided minimum flows are preserved).

[641] These are all matters of judgement and the Board has endeavoured to exercise its judgement in a way that will take proper account of the competing considerations, while giving effect to the NPSFM and the sustainable management purpose of the RMA. The Board believes that the mechanisms now provided under PC6 will enable people and communities to plan, provide for, and enhance their economic well-being with a degree of certainty. It also considers that the end result reflects an appropriate balancing of environmental and economic considerations.

[642] That completes the Board’s evaluation and findings in relation to the principal issues that were in contention. Now we will examine the relevant statutory instruments and the provisions of Part 2 of the RMA a little more closely.

[643] Section 67(1) and (2) set out the requirements that must be included in the Plan. It was not contended by anyone that the requirements of these provisions have not been met. 67(3) of the RMA requires a regional plan must give effect to any National Policy Statement, NZCPS and Regional Policy Statement. To ‘give effect to’ a higher order instrument requires a positive implementation of that instrument³⁴⁵ In addition 67(4) states that a regional plan must not be inconsistent with any other regional plan for the region.

³⁴⁵ *Clevedon Cares Inc v Manukau City Council*, NZEnvC 211 at Paragraph [50]

[644] Although most of the relevant documents have already been mentioned, we will briefly traverse all the documents that might be relevant, beginning with National Policy Statements.

National Policy Statement for Freshwater Management 2011

[645] Given that PC6 seeks to implement the NPSFM it is not surprising that this Policy Statement has already featured heavily in this report. The NPSFM is intended to promote national consistency in planning and decision-making for freshwater while allowing an appropriate level of regional flexibility in implementation.

[646] Part A of the NPSFM relates to water quality, Part B to water quantity, Part C to integrated management, and Part D to tāngata whenua roles and interests. These parts have already been discussed with reference to particular issues.

[647] Part E, which relates to progressive implementation of the policies in the Policy Statement by regional councils, warrants further comment. It provides:

...

- b) Every regional Council is to implement the policy as promptly as is reasonable in the circumstances, and so it is fully completed by no later than 31 December 2030.
- c) Where a regional council is satisfied that it is impracticable for it to complete implementation of a policy fully by 31 December 2014, the council may implement it by a programme of defined time-limited stages by which it is to be fully implemented by 31 December 2030.

...

Further policies specify the time frame within which a programme is to be fully adopted by the Council and also covers reporting requirements.

[648] As noted in the Ministers' Direction 'calling in' PC6, PC6 is one stage of a progressive implementation programme. Other changes will follow in due course. We are satisfied that PC6 gives effect to the NPSFM, including Part E.

National Policy Statement for Renewable Electricity Generation 2011

[649] This Policy Statement sets objectives and policies to enable the sustainable management of renewable electricity generation under the RMA. Its single objective is:

“To recognise the national significance of renewable electricity generation activities by providing for the development, operation, maintenance and upgrading of new and existing renewable electricity generation activities, such that the proportion of New Zealand’s electricity generated from renewable energy sources increases to a level that meets or exceeds the New Zealand Government’s national target for renewable electricity generation.”³⁴⁶

The preamble states that this National Policy Statement does not apply to the allocation and prioritisation of freshwater as these are matters for regional councils to address in a catchment or regional context.

[650] Charlotte Drury, Principal Consents Officer at HBRC, noted in the Key Issues Report prepared by HBRC for the EPA that:³⁴⁷

“Hydro-electricity generation is a type of renewable electricity generation activity to which the NPSREG applies. Change 6 is ‘silent’ on renewable electricity generation activities, but does contain policies and rules that provide for high flow allocations (e.g. Policy TT10), and potentially Community Irrigation Schemes (i.e. as in Policy TT13). But Change 6 does not propose that renewable electricity generation activities are a mandatory feature of any ‘Community Irrigation Scheme’.”

While agreeing with the HBRC Key Issues Report, Mr van Voorthuysen supported a change to the definition of ‘Community Irrigation Scheme’ so that it includes “other ancillary uses”, thereby allowing for hydro-electricity generation.

[651] The Board accepts that with the modification proposed by Mr van Voorthuysen PC6 positively gives effect to the National Policy Statement.

New Zealand Coastal Policy Statement 2010

[652] PC6 only applies to the landward boundary of the coastal marine area. It does not amend any regional planning documents applying within the Hawke's Bay coastal

³⁴⁶ National Policy Statement for Renewable Electricity Generation 2011, page 4.

³⁴⁷ C Drury, HBRC Tukituki Catchment Proposal: Key Issues Report prepared for the EPA, July 2013, page 12.

environment. Nevertheless the marine environment is the ultimate recipient of waters from the Tukituki River catchment.

[653] There is disagreement about whether the NZCPS is relevant. According to the HBRC Key Issues Report³⁴⁸ some of the NZCPS's provisions are 'somewhat relevant' to PC6 and various objectives and policies are mentioned. Mr van Voorthuysen does not consider that the NZCPS is relevant to PC6. Submitters were split on this issue.

[654] Given that decisions made in relation to the waters of the catchment upstream of the coastal marine area will have an influence on coastal waters the Board has decided to take the conservative approach of assuming that the NZCPS applies. We are satisfied that the improvements to water quality and quantity promoted by PC6 will give effect to the coastal policy statement.

Proposed National Policy Statement on Indigenous Biodiversity

[655] This policy statement is intended to provide clearer direction to local authorities on their responsibilities for managing indigenous biodiversity under the RMA. It outlines policies and decision-making frameworks for identifying and managing indigenous biodiversity found outside the public conservation estate.

[656] A list of criteria is provided for identifying areas of indigenous vegetation and habitats of indigenous animals that have been recognised as being rare and/or threatened at a national level. District and Regional Plans are required to identify areas of significant biodiversity within five years of the National Policy Statement taking effect. Local authorities would be required to manage the effects of activities through District and Regional Plans and resource consent decisions (or be satisfied that effects are managed by other methods).

[657] While the Board accepts that the National Policy Statement is only proposed at this time, it has nevertheless taken the proposed objectives and policies into account. We are satisfied that PC6 is not in conflict with the proposed National Policy Statement.

³⁴⁸ C Drury, HBRC Tukituki Catchment Proposal: Key Issues Report prepared for the EPA, July 2013, at page 13.

National Environmental Standards and Regulations

[658] Section 66(1)(f) states that a regional council must prepare and change any regional plan in accordance with any regulations.

[659] The *Resource Management (Measurement and Reporting of Water Takes) Regulations 2010*. These regulations apply to the measuring and keeping records of freshwater intakes at a rate of 5 l/s or more. POL TT 15, which provides for measuring and reporting through the use of water meters, makes provision³⁴⁹ for measuring and reporting of takes that are of a volume or nature that water meters cannot accommodate. It is specified that these are to be consistent with the Regulations. PC6 is consistent with the regulations.

[660] The *Resource Management (National Environmental Standards for Sources of Human Drinking Water) Regulations 2007*, have already mentioned in considering POL TT2 and table 5.9.1A of PC6. These regulations are intended to reduce the risk of drinking water sources being contaminated. We have already discussed these regulations with reference to public health and no further discussion is required.

[661] The *Proposed National Environmental Standard on Ecological Flows and Water Levels* has also been mentioned previously. This proposed standard is intended to develop a nationally consistent approach to establishing environmental flows and water levels. The standard is currently ‘on hold’ and remains only a proposed standard. Notwithstanding, we have found it helpful and believe that the decisions we have reached are consistent with the proposals contained in the document.

The Regional Policy Statement and Plan

[662] In Hawke’s Bay the Regional Policy Statement is combined with the Regional Plan. The RPS at Chapter 3.3 deals with “Loss and Degradation of Soil” is relevant to PC6 because the management of phosphorus losses which are often associated with soil loss is a key objective of the plan change.

³⁴⁹ Policy TT15(3).

[663] Chapter 3.8 which deals with “Groundwater Quality” is also relevant as is Chapter 3.9 which deals with “Groundwater Quantity” and Chapter 3.10 which deals with “Surface water Quality”.

[664] Mr van Voorthuysen expressed the opinion.³⁵⁰

“... Change 6 positively implements the above RPS policies, although it is fair to say that in some cases, for example, the setting of minimum flows and allocation volumes (POL TT7 and TT8 and Tables 5.9.3 and 5.9.4), managing stream depleting takes (POL TT11 and Table 5.9.7), and metering (POL TT15), Change 6 incorporates more up to date and sophisticated approaches that supersede some of the more prescriptive elements of the RPS policies.”

He noted that the Regional Plan was first drafted in the mid 1990s and the provisions that are relevant to PC6 had not been revisited until PC5 was promulgated in 2012.³⁵¹

[665] The Board is satisfied that PC6 gives effect to the Regional Policy Statement in terms of s 67(3) of the RMA. We also accept that for the purposes of s 66(2)(a) HBRC had regard to PC4 and PC5 which we have discussed earlier, and the Board has done likewise.

Regional Coastal Plan and Regional Coastal Environment Plan

[666] The Regional Coastal became operative in 1999. The Regional Coastal Environment Plan was notified on 30 August 2006 and has recently had final appeals on the Plan resolved. It is expected to be made operative soon at which point the operative Coastal plan will be superseded. Change 6 does not propose any consequential amendments to the coastal plan. Despite this HBRC considered the interconnectedness between the Tukituki River catchment and the coastal marine area in terms of indirect effects on coastal water quality. The Board has adopted a similar approach and has concluded that PC6 is not inconsistent with either the operative or the proposed coastal plans.

³⁵⁰ R van Voorthuysen, Evidence in Chief, paragraph 43.19.

³⁵¹ R van Voorthuysen, Evidence in Chief, paragraph 43.20.

Regional documents of adjacent regional councils

[667] Section 66(2)(d) of the RMA requires the Board to have regard to the extent to which PC6 needs to be consistent with the documents of adjoining Regional Councils. The s 32 Evaluation Report confirms that HBRC considered the provisions of the One Plan.³⁵²

[668] Having also undertaken that exercise the Board is satisfied that PC6 will be consistent with the Plans in that region. One of the reasons that PC6 was referred to a Board of Inquiry was that it involved methods of land and water management that are new to New Zealand. Apart from the One Plan, issues of this nature do not appear to have been considered by any other adjoining Regional Council.

Iwi/hapū management plans

[669] Under s 66(2A) of the RMA a regional council changing a plan is required to take into account any relevant planning document recognised by an Iwi Authority.

[670] The report ‘Kahungunu ki Uta, Kahungunu ki Tai marine and freshwater fisheries strategic plan was lodged with HBRC in August 2013. . Kahungunu ki Uta, Kahungunu ki Tai is formed by three groups, Ngāti Kahungunu Iwi Incorporated; the Coastal Hapū Collective Incorporated Society; and Kahungunu Asset Holding Company Limited. The group’s objective is to develop a strategic plan to guide the integrated management of fisheries, freshwater and coastal resources within the Kahungunu rohe. The Strategic Plan is intended to establish the basis for a “single door policy” for all agencies and groups seeking to consult on marine, estuarine and freshwater fisheries issues in the Kahungunu rohe.

[671] Ms McGuire³⁵³ gave evidence that Ngati Hori have a registered hapū management plan with HBRC, entitled Ngati Hori Freshwater Resources Management Plan2009/2012. The cornerstone priorities of the plan are:

³⁵² H Codlin and R van Voorthuysen, Section 32 Evaluation Summary Report for proposed Plan Change 6 Tukituki River Catchment, adopted by council on 24 April 2013, Folder 1 of Plan Change application documents, Tab 3, paragraph 3.4.

³⁵³ M McGuire, Evidence in Chief, paragraph 34.

- Achieving sufficient water flow;
- Improving water quality;
- Protection and restoration of traditional riparian vegetation;
- Protection and restoration of fish and fish habitat.

Ms McGuire attached a copy of the plan to her evidence.

These iwi/hapū management plans are, at least in part, relevant to the PC6 and the Board has taken them into account during its deliberations.

Concluding analysis

[672] The Resource Management Amendment Act 2013 came in to force on 3 September 2013, part way through the PC6 inquiry process. Some provisions of the Amendment Act came in to force immediately, while others were delayed. Some are the subject of transitional provisions and some will come in to force by Order in Council at a future date. It is necessary for the Board to consider the effect, if any, the Amendment Act has on its functions.

[673] By virtue of Schedule 12 of the RMA, Part 2 of the 2013 Amendment Act must be treated as not having come into force. The applications for Resource Consents³⁵⁴ and the NoR³⁵⁵ must be considered as if the amendments enacted by the Amendment Act had not been made.

[674] Other changes introduced by the 2013 Amendment Act to Part 6AA (sections 140 to 149ZE) of the RMA relating to Proposals of National Significance came into force³⁵⁶ on 3 September 2013. They therefore apply to this inquiry.

³⁵⁴ Clause 8 of Schedule 12 to the RMA.

³⁵⁵ Clause 7 of Schedule 12 to the RMA.

³⁵⁶ Clause 6 of Schedule 12 of the Resource Management Act 1991.

[675] Under s 149P of the RMA the Board is required to have regard to the Ministers' reasons for making their direction. These include the Ministers' view that PC6:

- addresses significant use of natural and physical resources including ... setting minimum flows and managing agricultural nutrient inputs to the catchment;
- has aroused widespread public interest as the Tukituki River experiences low flows in summer and a degraded water quality from nutrient enrichment;
- involves methods for water and land management that are new to New Zealand and may affect its environment.

When conducting the inquiry and arriving at its findings the Board has had regard to these matters (and the other reasons mentioned by the Ministers with reference to the whole Tukituki Catchment Proposal).

[676] The Board is also required by s 149P(6) to apply clause 10(1) to (3) of the First Schedule of the RMA³⁵⁷, s 66–70B³⁵⁸, and s 77A–D³⁵⁹ as if it were a Regional Council.

[677] The relevant parts of Section 66 require Regional Councils (and the Board by virtue of section 149P(6)) to prepare and change their Regional Plan in accordance with their functions under s 30, the provisions of Part 2 of the RMA, and the obligations under s 32³⁶⁰. In addition, the relevant parts of s 66(2) requires the Board to have regard to any proposed Regional Policy Statement.

[678] Section 30 of the RMA provides that:

- (1) Every regional council shall have the following functions for the purposes of giving effect to this Act in its region;

³⁵⁷ Which relates to the making of decisions on submissions.

³⁵⁸ Which relates to the contents of regional plans and related matters.

³⁵⁹ Which contain additional provisions in relation to regional rules.

³⁶⁰ S 66(1) of the Resource Management Act 1991.

- (a) The establishment, implementation, and review of objectives, policies and methods to achieve integrated management of the natural and physical resources of the region:
- (b) The preparation of objectives and policies in relation to any actual or potential effects of the use, development, or protection of land which are of regional significance:
- (c) The control of the use of land for the purpose of-
 - (i) Soil conservation:
 - (ii) The maintenance and enhancement of the quality of water in water bodies and coastal water:
 - (ii) The maintenance of the quantity of water in water bodies and coastal water:

...

As will be evident from the excerpts of section 30 quoted above, these functions lie at the very heart of PC6.

[679] The Board has evaluated each principal matter that was in contention and has arrived at a modified PC6 which is included in Volume 3 of this report. The Board considers that the provisions of PC6, as amended by Board's decision, meet the requirements of s 30.

Section 32 of the RMA

[680] As already noted, the Board must give consideration to, and apply, s 32 as it stood prior to the 2013 Amendment Act. Before making a decision under clause 10 of the Schedule 1, the Board was required to examine the extent to which each objective is the most appropriate way to achieve the purpose of the Act. It was also required to

examine whether, having regard to their efficiency and effectiveness, the policies, rules and other methods in PC6 are the most appropriate for achieving the objectives³⁶¹.

[681] The suite of PC6 documents included an analysis as required by s 32 of the RMA³⁶². This analysis covered all of the provisions of PC6 and assessed those provisions as required by s 32. This included an assessment whether the provisions of PC6 were the most appropriate way to achieve the purpose of the Act, other options, and the extent to which the proposed provisions would assist the HBRC to carry out its functions under the RMA.

[682] Of necessity the s 32 report adopted by HBRC on 24 April 2013 constituted an analysis of the PC6 provisions as they were then proposed, untested by the public participation provisions in the RMA, Schedule 1. Those public participation provisions include the ability to make submissions and further submissions and the hearing process which form the statutory process for the amendment of Plans.

[683] Some of the changes to PC6 sought by submitters were adopted by HBRC, and at an early stage of the hearing Mr van Voorthuysen presented a document incorporating changes that HBRC was prepared to accept at that time. By the conclusion of the hearing further amendments had been made and exhibit 90, which incorporated all the amendments that HBRC was prepared to accept, was presented to the Board. This highlighted the ongoing obligation to test PC6 as it evolved through the First Schedule process against the requirements of s 32.

[684] Section 32 includes a requirement for the extent to which the objectives are the “most appropriate” way to achieve the purpose of the Act to be examined. In *Rational Transport Soc Inc v New Zealand Transport Agency*³⁶³ the High Court did not accept that what was “most appropriate” must be the superior method in terms of one particular aspiration. The Court held:³⁶⁴

“Section 32 requires a value judgement as to what on balance, is the most appropriate, when measured against the relevant objectives.

³⁶¹ s 32 (2) and (3).

³⁶² s 32 evaluation Proposed Change 6.

³⁶³ [2012] NZRMA 298.

³⁶⁴ At Paragraphs 45 & 46 of the Judgement.

“Appropriate” means suitable, and there is no need to place any gloss upon that word by incorporating that it be superior. Further, the Freshwater Plan does not only have stream protection as a sole object; ...

As to Mr Bennion’s argument that s 32(3)(b) mandated that “each objective” had to be the “most appropriate way” to achieve the Act’s purpose; i.e. it was an error to look at the combined objectives; I do not agree that the Board is to be constrained in that way. It is required to examine each, and every, objective in its process of evaluation- that may, depending on the circumstances resulting more than one objective having different, and overlapping, ways of achieving sustainable management of natural and physical resources (the purpose of the Act). But objectives cannot be looked at in isolation, because “the extent” of each may depend upon inter relationships....”

This approach is, of course, consistent with an ‘overall broad judgement’ approach to the interpretation of the RMA and its application to the statutory processes under the Act.

[685] In *NZ Rail Ltd v Marlborough DC*³⁶⁵ the High Court held that the provisions in Part 2 of the Act:

“...should not be subjected to strict rules and principles of statutory construction which aim to extract a precise and unique meaning from the words used. There is a deliberate openness about the language, its meanings, and its connotations which I think is intended to allow the application of policy in a general and broad way.”

Applying s 32 to the Objectives

[686] The Board is satisfied that the Objectives as amended throughout the submission and hearing process are consistent with the NPSFM, RPS and are the most appropriate way to achieve the purpose of the RMA and the promotion of sustainable management of natural and physical resources. In reaching this conclusion we note that there was substantial agreement (but not absolute consensus) amongst the expert planning witnesses about the proposed Objectives.³⁶⁶

[687] The areas of OBJ TT1 on which there was not absolute consensus amongst the experts and submitters focused on the inclusion of TT1 (f) and its reference to water

³⁶⁵ [1994] NZRMA 70

³⁶⁶ See JWS of Planners dated 22 October 2013

takes for primary production and food, beverages and fibre processing ‘being enabled’. Ms Marr also wanted OBJ TT1 to include reference to managing the ‘physical’ characteristics of rivers.

[688] As to the inclusion TT1 (f) the Board took into account that the Tukituki Catchment is largely of a rural nature. Under those circumstances it considered it would be unrealistic to leave this activity out of the Objectives and that such an approach would not be the most appropriate way of achieving either the purpose of the Act or the integrated management regime contemplated by s 30. Therefore, subject to minor modification, the Objective was included.

[689] When taken as an integrated package the Board is satisfied that Objectives TT1, TT2, TT4, TT4A and TT5 achieve the necessary balance between the competing interests that arise when s 5 is applied.

Applying s 32 to the Policies and Rules

[690] As will be evident from this report and the decisions that the Board has made in relation to PC6, it was not satisfied that some of the proposed Policies and Rules were the most appropriate way of achieving the Objectives in PC6. Consequently significant amendments were made. In particular, the Board rejected the reliance on what was effectively a single nutrient control (the focus on managing phosphorus while allowing substantial increases in nitrogen leaching).

[691] Objective TT1 set out the aspirations in terms of water quality and quantity both in terms of ecosystem health and from a cultural mauri perspective. The Board considered that in relation to quality substantial amendments to the relevant Policies are required if those Objectives are to be achieved. We consider that the changes to instream DIN water quality levels better achieve Objective TT1.

[692] The Board’s decision introduces an integrated regime involving FEMPs, LUC based nitrogen leaching rates, phosphorus management and nutrient budgeting involving both nitrogen and phosphorus. When arriving at that decision the Board evaluated a number of options ranging from a more regulated land use regime to a less regulated regime. We are satisfied that as amended by the amended the Policies and

Rules are efficient, effective and the most appropriate way of achieving the PC6 water quality Objectives.

[693] After considering the possible options as to water quantity the Board decided that some amendments to the Policies and Rules relating to quantity were necessary if the Objectives were to be achieved, and the most efficient and effective method of managing water quantity was to be achieved. Accordingly it amended water allocation limits applying to Ruataniwha aquifer so that there could be increased abstraction (provided the minimum flow regime was protected). It considered that these amendments were beneficial and cost effective. On the other hand, after applying the tests in s 32, it was satisfied that the minimum flow regime did not require amendment.

[694] In terms of assessing the benefits and costs of the environmental, economic, social and cultural effects associated with PC6, as will be evident from the Board's discussion of the issues throughout this decision, the issues are not as readily defined as economic or social prosperity versus environmental degradation or the compromising of cultural values.

[695] Rather, the issues involve sustainable management of resources. The benefits in economic and social terms of a regime that envisages more production, more intensive use of resources and greater regional prosperity are obvious. Again there was agreement between the expert economists on the economic impacts of PC6³⁶⁷. Similarly, the imperatives of sustainable management and the provisions of the NPSFM highlight the potential environmental costs and 'costs' in terms of cultural effects, of allowing such use and development to proceed in an unregulated manner. Although these latter costs are not readily quantifiable in dollar terms, they are no less important.

[696] When viewed in an overall and integrated way, the provisions of PC6 will allow for more intensive use and development while safeguarding the environment so that the sustainable management purpose of the Act can be achieved. This will require careful land and water management and the use of new and innovative farm management practices and technologies. While the Objectives, Policies and Rules in PC6 might

³⁶⁷ See the JWS of the Expert economists 15 October and 23 October 2013.

present issues for the poorer performing resource users, the evidence before the Board indicates they should not be a problem for the majority of farmers.

[697] As will be apparent from this report, the Board does not see economic development and intensification of land use and maintaining and enhancing the environment and cultural wellbeing as mutually exclusive. As Mr Macfarlane³⁶⁸ noted, “entire systems have been designed around optimising the balance between productivity and environmental outcomes (which are rarely antagonistic)”.

[698] As detailed throughout this decision and in the discussion above, the Board considers that having evaluated the objectives policies and rules in PC6 as required by section 32, that the provisions represent the most appropriate way of achieving the purpose of sustainable management of natural and physical resources in the Tukituki catchment.

Part 2 of the RMA

[699] Part 2 of the RMA sets out the purposes and principles of the Act. It begins with s 5 which provides:

5. Purpose

- (1) The purpose of this Act is to promote the sustainable management of natural and physical resources.
- (2) In this Act, **sustainable management** means managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural well-being and for their health and safety while –
 - (a) sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and
 - (b) safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and

³⁶⁸ A Macfarlane, Evidence in Chief, paragraph 5.8.

- (c) avoiding, remedying, or mitigating any adverse effects of activities on the environment.

Section 5 has been described as the ‘engine room’ of the RMA and it is intended to infuse the approach to the RMA’s interpretation and implementation. Refer to *Auckland City Council v John Woolley Trust*³⁶⁹ and *Falkner v Gisborne District Council*.³⁷⁰

[700] Case law has established that none of the elements of sustainable management necessarily has precedence over any other. Rather, the Act has a single purpose, and whether a particular provision in a Plan serves that purpose calls for an overall broad judgment of potentially conflicting considerations in terms of their relative significance or proportion in attaining or promoting the sustainable management of natural and physical resources³⁷¹. The enabling elements of section 5(2) are not absolute, or necessarily predominant. They must be able to co-exist with the purposes in sections 5(2) (a) to (c) and vice versa³⁷².

[701] The balancing the use and development of resources against the protection of the environment has been a constant theme and tension throughout the inquiry process. The Board considers that PC6 as amended achieves the appropriate balance and achieves the sustainable management purpose of the Act.

[702] Section 6 lists matters of national importance that the Board is required to ‘recognise and provide for’. Where relevant those matters have been considered with reference to particular issues that were in contention. Section 6(c)³⁷³ and (e)³⁷⁴ warrant further mention. Among the amendments to PC6 that will recognise and provide for these matters, the Board highlights the dual management regime for the management of nitrogen and phosphorus which, amongst other things, addresses the periphyton issue in the catchment, thereby enhancing the mauri of the waters in the catchment and the health of the aquatic ecology.

³⁶⁹ *Auckland City Council v John Woolley Trust*, [2008] NZRMA 260

³⁷⁰ *Falkner v Gisborne District Council*, [1995] 3 NZLR 622 .

³⁷¹ *Green & McCahill Properties v Auckland Regional Council*, [1997], NZRMA 519,

³⁷² *Day v Manawatu–Wanganui Regional Council*, [2012] NZEnvC 182.

³⁷³ *Protection of significant habitats of indigenous fauna*

³⁷⁴ *Relationship of Māori with water*

[703] Section 7 RMA requires particular regard to be had to other matters. Of particular relevance are kaitiakitanga³⁷⁵, the ethic of stewardship³⁷⁶, the efficient use and development of natural and physical resources³⁷⁷, the maintenance and enhancement of amenity values³⁷⁸, intrinsic values of ecosystems³⁷⁹, maintenance and enhancement of the quality of the environment³⁸⁰, the finite characteristics of natural and physical resources³⁸¹, the protection of the habitat of trout³⁸² and the benefits from the use and development of renewable energy³⁸³.

[704] The Board has had particular regard to all those matters. Again it believes that the dual management regime introduced by PC6 will be of particular significance in restoring the health and amenity values of the waters in the catchment and giving effect to NPSFM. The Board also considers POL TT16 will enable tāngata whenua to play a greater role in the management and monitoring of the waters within the catchment.

[705] Finally, s 8 directs that all people exercising functions under the Act to take into account the principles of the Treaty of Waitangi. During the course of its evaluation of the principal issues that were in contention and when arriving at its main findings the Board has taken into account the principles of the Treaty.

Draft decision

[706] For those reasons the Board has made the amendments to PC6 (**NSP 13/02. 001**) discussed earlier. A version of PC6 showing the amendments the Board has made is Appendix 5 of Volume 2 of this report. PC6 in its final form is included in Volume 3.

[707] The EPA is to provide a copy of this report and decision to the parties specified in s 149Q and invite comments on minor or technical matters in accordance with that section.

³⁷⁵ Section 7(a)

³⁷⁶ Section 7(aa)

³⁷⁷ Section 7(b)

³⁷⁸ Section 7(c)

³⁷⁹ Section 7(d)

³⁸⁰ Section 7(f)

³⁸¹ Section 7(g)

³⁸² Section 7(h)

³⁸³ Section 7(j)

PART 3

THE RUATANIWHA WATER STORAGE SCHEME

Introduction

[708] Having now resolved PC6 in Part 2 of this report, it remains to determine the 17 applications for resource consents and the NoR applied for from HBRIC. While every effort has been made to avoid unnecessary duplication, some repetition of matters that were discussed in Part 2 is unavoidable because the matters to be addressed in this Part involve a different context and different considerations.

[709] Part 3 begins by providing background information concerning the scheme, the applications and the NoR, and the relevant statutory framework. Then particular issues, including the actual and potential effects of the RWSS, are addressed and findings made. Part 3 concludes by recording the Board's decisions on the various applications and the NoR.

The Scheme

[710] A full description of the proposed RWSS can be found in the Ruataniwha Water Storage Scheme Project Description Report (May 2013) by Tonkin & Taylor Limited. In broad terms the scheme involves the construction of a dam and a downstream irrigation distribution network. We now outline those components of the proposed scheme.

Proposed dam

[711] The dam would be located on the Makaroro River in the foothills of the Ruahine Ranges several kilometres upstream of that river's confluence with the Waipawa River (Figure 8). It is under 1km from the Mohaka Fault.

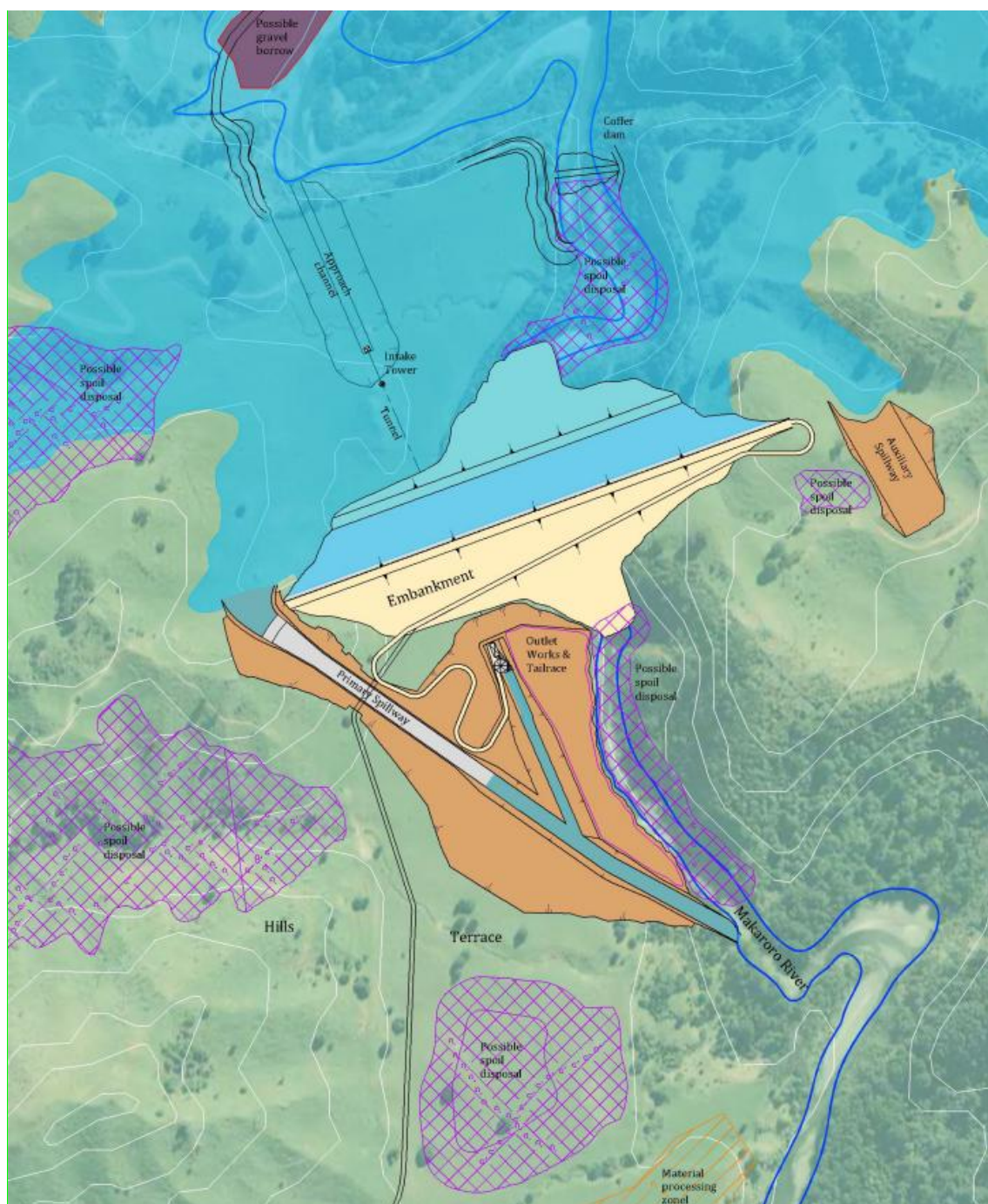


Figure 8: Layout of the Proposed Dam³⁸⁴

[712] The dam would be a concrete-face rockfill dam (CFRD) consisting of bulk coarse rockfill material with a concrete-face slab on the upstream side. At the river's deepest point the dam will be 83m high. The crest of the dam will be 505m long and

³⁸⁴ HBRC Engineering, Ruataniwha Water Storage Scheme – Dam Break analysis, May 2013, Ruataniwha Water Storage Scheme application documents, Folder 7, Tab 4, page 7, figure 3.

8m wide. When full the dam would retain 90.7million m³ of water at RL 469.5 m. The surface lake area would be 370ha and the reservoir will extend almost 7km upstream of the dam.

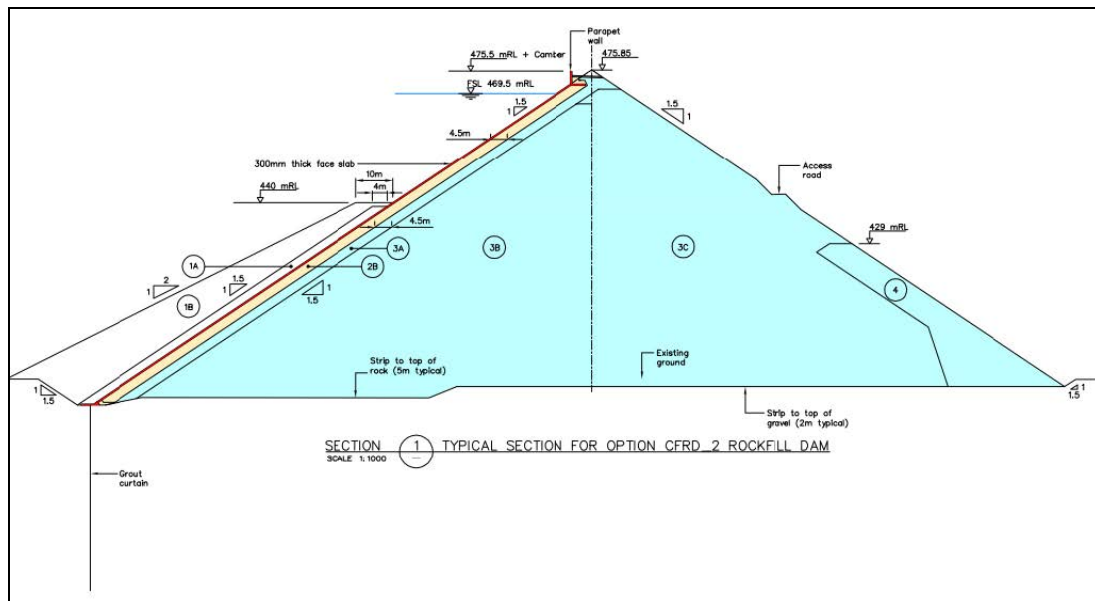


Figure 9: Cross-section of the Proposed Dam³⁸⁵

[713] A concrete-lined primary spillway is located on the right-hand abutment of the dam and an unlined auxiliary spillway is located on the left-hand abutment. A concrete intake structure located within the reservoir, and a tunnel, (4m in diameter) would run through the dam.



Figure 10: A CRFD at Opuha (which is 50m high)³⁸⁶

³⁸⁵ HBRC Engineering, Ruataniwha Water Storage Scheme – Dam Break analysis, May 2013, Ruataniwha Water Storage Scheme application documents, Folder 7, Tab 4, page 7, figure 3.

[714] At the toe of the dam would be a small 6.5MW hydro-electric power station and associated transmission infrastructure, including a transformer adjacent to the power station. A 33kV transmission line would connect the power station to the existing Ongaonga Substation which is about 21.5km away as the crow flies.



Figure 11: Hydropower Station and Switchyard at the Opuha Dam³⁸⁷

[715] The Tonkin & Taylor Report³⁸⁸ states that the Ruataniwha power station would resemble the power station at the Opuha dam. Hence the photograph (Figure 11). Compared with the 12m diameter of the proposed powerhouse, the diameter of the Opuha powerhouse is 9.5m as shown in Figure 11.

³⁸⁶ Isthmus, Ruataniwha Water Storage Scheme – landscape and visual effects assessment, May 2013, Ruataniwha Water Storage Scheme application documents, Folder 7, Tab 3, page 19, figure 8.

³⁸⁷ Tonkin & Taylor, Ruataniwha Water Storage Scheme – project description, May 2013, Ruataniwha Water Storage Scheme application documents, Key Reference Report, Folder 3, Tab 1, page 101, photo 6.1.

³⁸⁸ Project Description Report (May 2013) by Tonkin & Taylor Limited.

Irrigation distribution network

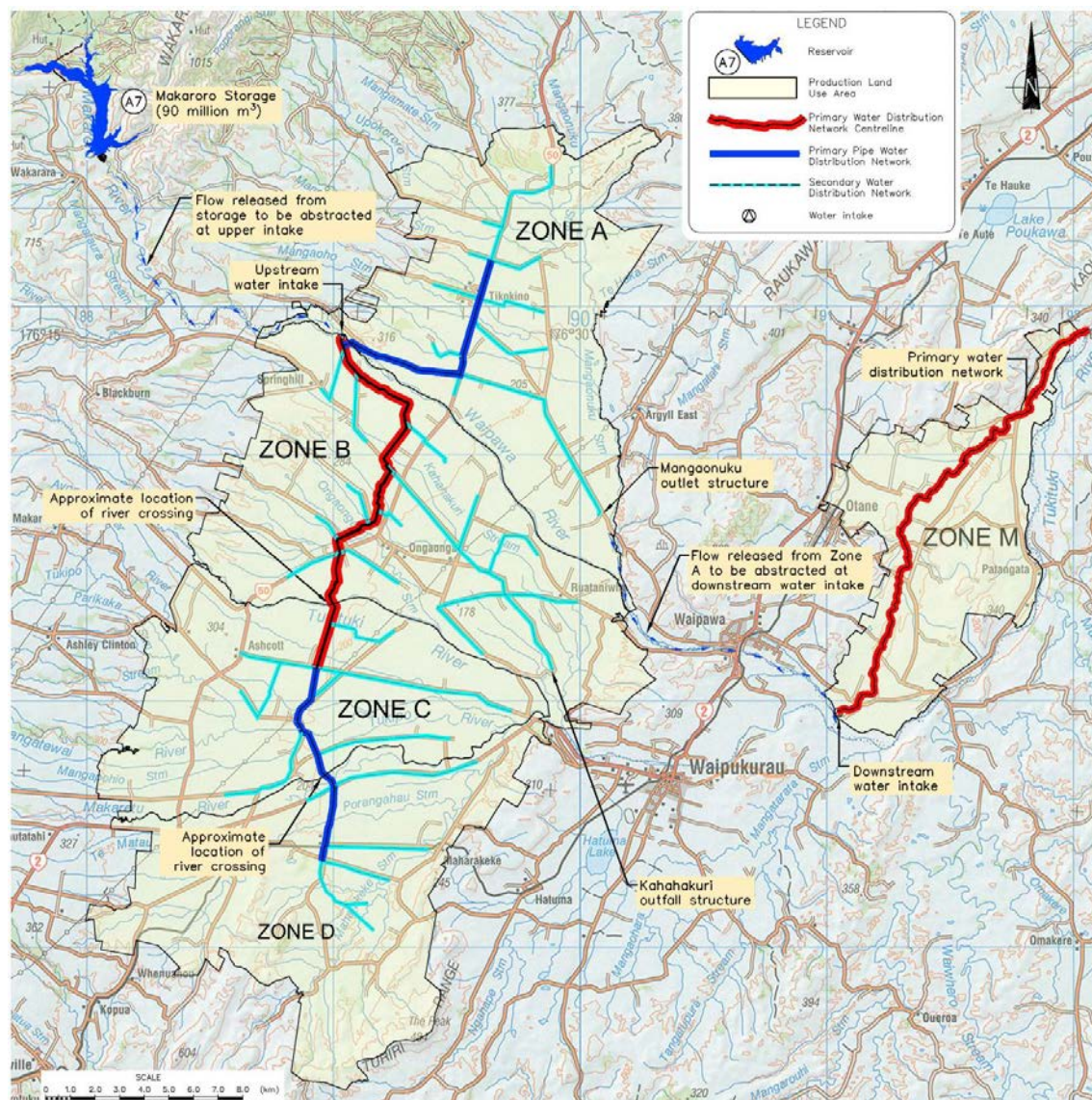


Figure 12: Irrigation Distribution Network³⁸⁹

[716] As will be seen from this plan Figure 12, irrigation Zones A–D would be served by primary and secondary distribution networks. The primary network comprising headrace canals and underground pipes would extend over approximately 36km. The NoR relates to this part of the network. The secondary distribution network involves

³⁸⁹ Tonkin & Taylor, Ruataniwha Water Storage Scheme – project description, May 2013, Ruataniwha Water Storage Scheme application documents, Key Reference Report, Folder 3, Tab 1, page 8, photo 2.1.

approximately 121km of underground pipes. For Zone M the old Waipawa riverbed and the Papanui Stream would be utilised as the primary distribution network.

Distribution network for Zones A–D

[717] This distribution network commences with an upstream water intake structure on the Waipawa River which would divert part of the river flow (including the controlled releases from the dam) for use within Zones A–D (Figure 12). The intake would be screened to exclude fish.



Figure 13: Location of Intake for Zones A–D³⁹⁰

[718] The alignment of the headrace canal would be constrained by the topography of the area and follow the base of hilly ground to maintain ‘head’ while minimising earthworks. The width of the canal varies from 8.6m to 21m and the depth from 1.4m to 2.7m. A gravelled access track would run alongside the canal which would be fenced (Figure 14).

Within the headrace canal there would be five ‘drop structures’ to enable the elevation of the canal to be reduced as it reaches lower land. These structures range from 5m to

³⁹⁰ Tonkin & Taylor, Ruataniwha Water Storage Scheme – project description, May 2013, Ruataniwha Water Storage Scheme application documents, Key Reference Report, Folder 3, Tab 1, page 80, photo 5.1.

8m in height. At some points there would be ‘siphons’ where the canal is piped across rivers or streams, and bridges would cross the canal at various locations.



Figure 14: A Canal at Rangitata (similar to the canals proposed for the RWSS)³⁹¹

[719] Diameters of the underground pipes forming the primary distribution network vary from 1600mm to 630mm. Where possible this distribution network would be aligned to follow roads or property boundaries.

[720] A secondary distribution network would convey irrigation water from the primary network to of farm gates. At various points there would be ‘booster’ pumps to maintain positive pressure to areas that could not be supplied by gravity. Pump sheds would be required.

[721] Outlet structures would discharge water from the distribution network into a tributary of the Mangaonuku Stream (which would then flow back into the Waipawa River) and a farm water course/drain connecting to the Kahahakuri Stream (which would then flow into the Tukituki River). The outlet structures would dissipate the energy of any water leaving the irrigation system and returning to rivers or streams so that instream environmental damage, including damage to fish spawning, is avoided. The Project Description report by Tonkin & Taylor³⁹² indicates that high pressures might occur when the scheme has few users, such as during the initial phase after construction.

³⁹¹ Isthmus, Ruataniwha Water Storage Scheme – landscape and visual effects assessment, May 2013, Ruataniwha Water Storage Scheme application documents, Folder 7, Tab 3, page 19, figure 9.

³⁹² Tonkin & Taylor, Ruataniwha Water Storage Scheme – project description, May 2013, Ruataniwha Water Storage Scheme application documents, Key Reference Report, Folder 3, Tab 1, paragraph 5.7.1.1.

Distribution network for Zone M

[722] The proposed downstream intake for this zone is on the northern bank of the Waipawa River, downstream of Waipawa and a little under 1km upstream of the confluence of that river with the Tukituki (Figure 15). Again there would be screening to exclude fish.



Figure 15: Waipawa River in the Vicinity of the Proposed Downstream Water Intake³⁹³

[723] Many years ago the Waipawa River flowed in a north-easterly direction through Zone M. In the 1880s it was diverted to join the Tukituki River at its current confluence. As a result the Papanui Stream now flows along part of the old Waipawa River. It is fed by groundwater, run-off from the surrounding land and drainage from the Te Aute Basin via a man-made diversion. Currently the Papanui Stream is in a degraded condition.

[724] Under the proposed scheme the old Waipawa riverbed and the Papanui Stream would provide the primary distribution network for Zone M, with individual farm irrigation takes being installed at various locations along the length of the network. A combination of canal and stop bank construction within the old riverbed would be

³⁹³ Tonkin & Taylor, Ruataniwha Water Storage Scheme – project description, May 2013, Ruataniwha Water Storage Scheme application documents, Key Reference Report, Folder 3, Tab 1, page 95, photo 5.9.

required. It is estimated that at peak irrigation demand the flow would be 1.77 m³/s. To support instream ecology a residual flow of 50 l/s would be continuously supplied to the Papanui Stream. Riparian planting would take place along the entire length of the stream.

Applications before the Board

[725] The applications for resource consents before the Board are (depending on the particular application) within the administrative jurisdiction of the CHBDC, HDC and HBRC.³⁹⁴ The NoR is within the jurisdiction of CHBDC. A list of the matters applied for by HBRIC is detailed in Appendix 6 of Volume 2 of this report and summarised below. Some of the activities involved in the scheme are permitted by the relevant plan/s and no consents are required for those activities.

[726] It is convenient to divide the applications for resource consent into two groups: those relating to the construction phase and those relating to the post-construction phase.

Applications relating to the construction phase

[727] Ten applications cover everything to do with the construction of dam structures and other activities such as earthworks (including borrow areas and cut-to-waste disposal areas), vegetation clearance, streambed works, and gravel extraction, water takes, construction lay down areas, concrete batching, and all associated discharges to land, air and water, including discharges of stormwater.

[728] The following consents relate to the construction of the dam:

- **NSP 13/02. 019:** *Land use consent* for the establishment and operation of a water reservoir on and in the vicinity of the Makaroro River within the jurisdiction of the HDC;

³⁹⁴ Part A – resource consent applications and Part B – Notice of Requirement – Zones A to D primary distribution systems, Ruataniwha Water Storage Scheme application documents, Folder 1, Tab 1 and Tab 2.

- **NSP 13/02. 018:** *Land use consent* for all uses of land associated with construction, operation and maintenance of (a) Water storage dam, (b) intake structures, (c) outfall structures, (d) all associated earthworks, vegetation removal, road construction, plantings, storage of hazardous substances, within the jurisdiction of the CHDB;
- **NSP 13/02. 002 (HBRC Consent Number: LU120370C):** *Land use consent, water permit and discharge permit* to build, operate, and maintain a dam on the Makaroro River;
- **NSP 13/02. 003 (HBRC Consent Number: WP120371M):** *Water permit and discharge permit* to dam, take, divert, use (for electricity) and to operate the dam and reservoir.

[729] Further consents are sought for ‘other structures’:

- **NSP 13/02. 004 (HBRC Consent Number: LU120372C):** *Land use consent, water permit and discharge permit* to build and maintain the upstream water intake structure on the Waipawa River;
- **NSP 13/02. 006 (HBRC Consent Number: LU120374C):** *Land use consent, water permit and discharge permit* to build operate and maintain a downstream water intake structure on the Waipawa River;
- **NSP 13/02. 008 (HBRC Consent Number: LU120376C):** *Land use consent, water permit and discharge permit* to install and maintain siphons pipelines and/or culverts associated with a water distribution system under the beds of rivers and streams;
- **NSP 13/02. 009 (HBRC Consent Number: LU120377C):** *Land use consent, water permit and discharge permit* to build and maintain the primary headraces, canals and pipelines within, or near to, the beds of rivers and streams, and to also allow for emergency overflow/spillway discharges to land and surface water;

- **NSP 13/02. 010 (HBRC Consent Number: LU120378C):** *Land use consent, water permit and discharge permit* to build and maintain water outfall structures on a tributary to the Mangaonuku Stream;
- **NSP 13/02. 012 (HBRC Consent Number: LU120380C):** *Land use consent, water permit and discharge permit* to build and maintain water outfall structures on the Kahahakuri Stream.

Applications relating to the post-construction phase

[730] Applications in this category are intended to cover all aspects of the ongoing existence, operation, and maintenance of the RWSS so that irrigation water can be supplied to farmers who participate in the scheme. In summary:

[731] *Water permits* are sought to:

- Take water from the Waipawa River via the two water intake structures (**NSP 13/02. 005 (HBRC Consent Number: WP120373T)**);
- Use water from the Waipawa River for water supply, including irrigation purposes on production land (**NSP 13/02. 007 (HBRC Consent Number: WP120375T)**).

[732] *Discharge permits* are sought to discharge water and any associated contaminants:

- Through the outfall structure to a tributary of the Mangaonuku Stream **NSP 13/02. 011 (HBRC Consent Number: DP120379W)**;
- Through the outfall structure to a tributary of the Kahahakuri Stream (**NSP 13/02. 013 (HBRC Consent Number: DP120381W)**).

[733] *Land use consents* are sought:

- For the use of production land within the Tukituki River catchment facilitated by the RWSS **NSP 13/02. 014 (HBRC Consent Number: LU120382L)**;
- To allow for trees and shrubs to be planted within the Upper Tukituki Flood Control Scheme area (**NSP 13/02. 015 (HBRC Consent Number: LU120388P)**).

[734] *A coastal permit* is sought:

- To allow for the placement of sand and gravel for the purposes of beach nourishment in the Coastal Marine Area (CMA) at the mouth of the Tukituki River (**NSP 13/02. 016 (HBRC Consent Number: LU120400D)**).

The Notice of Requirement for a designation

[735] The NoR (**NSP 13/02. 017**) relates to the primary headrace canal and pipelines located within Zones A–D. In terms of the NoR the designation is to enable the supply of water through the primary distribution network by:

- providing for the primary distribution system headrace canal and pipeline within Zones A–D of the scheme, including the construction of farm bridges over the headrace canal;
- placing restrictions on land and water as reasonably necessary for the safe or efficient functioning or operation of the primary distribution system headrace canal and pipeline within Zones A–D of the scheme.

For the canal the corridor of land in respect of which the designation is sought is a maximum of 100m wide and an average of approximately 60m wide where the primary distribution headrace canal is proposed. It is a maximum of 25m wide where the primary distribution pipeline is proposed.

[736] A series of plans showing the land that is to be subject to the NoR are attached to the NoR³⁹⁵.

Framing and categorisation of the applications

[737] It appeared to be common ground that the correct applications for the proposed RWSS had been made and that the categorisation of the applications (as land use consents and so on) is accurate. Thus the primary issue for the Board is whether or not the applications for resource consent should be granted and the NoR confirmed (and if so, the conditions that should apply) rather than any technicalities surrounding the framing or categorisation of the applications.

'Bundling' of applications

[738] The multiple resource consent applications before the Board involve a single proposal. Where multiple consents for one proposal overlap to such an extent that they cannot be realistically or properly separated, a holistic approach is traditionally adopted with the proposal being assessed on the basis of the most stringent classification. The intended purpose of bundling consents in this manner is to ensure that an overall judgment can be brought to bear as to whether the proposal is in accordance with the purpose of the RMA. This is referred to as bundling.

[739] There was general agreement between the planners that the applications before the Board should be bundled and considered as a discretionary activity.³⁹⁶ The Board agrees and has adopted that approach when considering the applications.

Further applications

[740] The RWSS Planning Assessment³⁹⁷ identified a number of additional resource consents that had not been applied for at this stage but are likely to be required in due course. These can be summarised:³⁹⁸

³⁹⁵ Part B – Notice of Requirement – Zones A to D primary distribution systems, Ruataniwha Water Storage Scheme application documents, Folder 1, Tab 1 and Tab 2.

³⁹⁶ Expert Conferencing Joint Witness Statement to the Board of Inquiry - Planners (RWSS planning assessment), 23 October 2013, paragraph 11.

³⁹⁷ Environmental Management Service Limited, Ruataniwha Water Storage Scheme – planning assessment, May 2013, Ruataniwha Water Storage Scheme application documents, Folder 5, Tab 1, page 25, paragraph 4.4.

- Sediment extraction from within the reservoir behind the proposed dam (post construction) for the purpose of maintaining water storage capacity;
- Stream crossings associated with secondary pipelines;
- ‘By-wash’ associated with secondary pipelines;
- Bridges or other forms of stream crossings within Zone M;
- Sediment extraction for beach nourishment purposes.

Statutory Framework for the Board’s Deliberations

[741] Part 1 has already provided an overview of the statutory framework in Part 6AA of the RMA which governs proposals of national significance. Section 149P specifies the matters that must be considered by the Board, including a requirement for the Board to have regard to the Ministers’ reasons for directing the matter to the Board and any information provided to it by the EPA under s 149G.

[742] Beyond these requirements there are particular provisions relating to the applications for resource consent and the NoR. There are also specific requirements relating to the contents of the Board’s report. We will briefly explain each of these matters.

Provisions relating to the resource consent applications

[743] In relation to the resource consent applications the Board is required by s 149P(2) to apply ss 104–112 of the RMA as if it were a consent authority.

[744] For present purposes the critical section is s 104 which relevantly provides:

³⁹⁸ C Drury, HBRC Tukituki Catchment Proposal: Key Issues Report prepared for the EPA, July 2013, page 29.

“104 Consideration of applications

- (1) When considering an application for a resource consent and any submissions received, the consent authority must, subject to Part 2, have regard to –
- (a) any actual and potential effects on the Environment of allowing the activity; and
 - (b) any relevant provisions of –
 - (i) a national environmental standard;
 - (ii) other regulations;
 - (iii) a national policy statement;
 - (iv) a New Zealand coastal policy statement;
 - (v) a regional policy statement or proposed regional policy statement; and
 - (vi) a plan or proposed plan; and
 - (c) any other matter the consent authority considers relevant and reasonably necessary to determine the application.”

...

Apart from s 104B which empowers a consent authority to grant or refuse an application and impose conditions under s 108 if the application is granted, the remaining sections referred to in s 149P(2) are of no immediate significance.

Provisions relating to the Notice of Requirement

[745] A NoR for a designation may only be issued by a requiring authority. As we have already mentioned in Part 1, HBRIC was approved as a Requiring Authority on 28 March 2013.³⁹⁹ When considering a NoR the Board is directed by s 149P(4) to have regard to the matters set out in s 171(1) and to comply with s 171(1A) as if it were a territorial authority.

[746] Section 171 relevantly provides:

³⁹⁹ <http://www.mfe.govt.nz/rma/central/designations/requiring-authorities-table.html>

“171 Recommendation by territorial authority

- (1A) When considering a requirement and any submissions received, a territorial authority must not have regard to trade competition or the effects of trade competition.
- (1) When considering a requirement and any submissions received, a territorial authority must, subject to Part 2, consider the effects on the environment of allowing the requirement, having particular regard to –
- (a) any relevant provisions of –
 - (i) a national policy statement;
 - (ii) a New Zealand coastal policy statement;
 - (iii) a regional policy statement or proposed regional policy statement;
 - (iv) a plan or proposed plan; and
 - (b) whether adequate consideration has been given to alternative sites, routes, or methods of undertaking the work if –
 - (i) the requiring authority does not have an interest in the land sufficient for undertaking the work; or
 - (ii) it is likely the work will have a significant adverse effect on the environment; and
 - (c) whether the work and designation are reasonably necessary for achieving the objectives of the requiring authority for which the designation is sought; and
 - (d) any other matter the territorial authority considers reasonably necessary in order to make a recommendation on the requirement.”

...

Although s 171(2) only allows territorial authorities to make a recommendation to the requiring authority, the Board has wider powers under s 149P(4)(b). It can confirm the requirement, modify it, and impose such conditions as the Board thinks fit.

[747] The approach that the Board is required to adopt in relation to the NoR is similar to the approach the Board is required to take in relation to the applications for resource consents. However, there is a subtle distinction. Whereas in relation to applications for resource consents the Board must “have regard to” any actual or potential effects on the environment, in the case of the NoR it is required to consider the effects on the environment. Part 2 of the RMA prevails in each case.

[748] Another subtle distinction is that the Board is required to “have regard to” the relevant statutory instruments referred to in s 104(1)(b) and to “have particular regard to” the relevant statutory instruments referred to in s 171(1)(a).

[749] The main difference between the application for the resource consents and the NoR is that there are two additional considerations in the case of the NoR. The first is whether adequate consideration has been given to alternative sites, routes or methods, and the second is whether the work and designation are reasonably necessary for achieving the objectives of the requiring authority for which the designation is sought.

Contents of the Board’s report

[750] As mentioned in Part 1, ss 149Q(2) and 149R(3) require the Board to include in its draft and final reports “a statement of the principal issues that were in contention” and the “main findings” of the Board on those issues. At first sight this might suggest that the Board would be justified in confining its attention to the major issues and effectively ignoring issues that might not have been raised with any vigour at the hearing.

[751] One of the major issues is the actual and potential effects on the environment of the RWSS. This means that in terms of ss 104(1)(a) the Board *must*, subject to Part 2 of the RMA, have regard to “any actual and potential effects on the environment” of allowing the RWSS. And in the case of the NoR the Board is required by s 171(1) to consider the effects on the environment of allowing the requirement. Thus a wide range of matters need to be considered.

[752] When determining the matters in issue we have been assisted by the ‘Assessment of Environmental Effects’ (AEE)⁴⁰⁰ filed with the application suite and the ‘RWSS Planning Assessment’⁴⁰¹ both of which identified a range of issues that require

⁴⁰⁰ Hawke’s Bay Regional Investment Company Ltd, Ruataniwha Water Storage Scheme – Part C Assessment of Environmental Effects, May 2013, Ruataniwha Water Storage Scheme application documents, Folder 2, Tab 1.

⁴⁰¹ Environmental Management Service Limited, Ruataniwha Water Storage Scheme – planning assessment, May 2013, Ruataniwha Water Storage Scheme application documents, Folder 5, Tab 1.

the Board's consideration. We also have been assisted by the Key Issues Reports provided by HBRC, CHDC and HDC⁴⁰² pursuant to s 149G.

Principal issues that were in contention

[753] For the purposes of ss 149Q and 149R the Board has concluded that the principal issues in contention were:

- the actual and potential effects of scheme on the environment in terms of s 104(1);
- consultation;
- lapsing period for resource consents and NoR;
- s 105(1) considerations;
- s 107 considerations;
- s 171 matters;
- consideration of alternatives;
- mitigation and offsetting;
- management plans;
- Part 2 matters.

As the Board found when considering the principal issues relating to PC6, there is an overlap between many of these issues.

[754] The first principal issue that was in contention — the actual and potential environmental effects under s 104 — gives rise to its own list of issues:

- Geotechnical design and dam safety;

⁴⁰² It should be noted the CHBDC and HDC produced a combined Key Issues report under s 149G of the RMA.

- water quality/land use;
- water quantity;
- roading, traffic, noise, and dust;
- soil contamination;
- network utilities;
- terrestrial ecology;
- aquatic ecology;
- archaeology and built heritage;
- landscape;
- cultural;
- amenity, recreation and social;
- economics.

[755] Some of these effects arise during the course of construction while others are post-construction effects. In order not to traverse the same ground twice we have identified each issue and have considered its relevance in both the construction and post-construction phases.

[756] As we mentioned with reference to PC6, there are numerous reports, submissions, representations and evidence before the Board in relation to the RWSS. They reflect considerable effort and thought on the part of all involved. While it has not been possible to make specific reference to all these matters the Board has taken them into account when undertaking its evaluation and arriving at its findings.

[757] The Board has also had regard to (and in the case of the NoR had “particular regard to”) the relevant instruments referred to in ss 104(1)(b) and 171(1)(a). Where appropriate we will mention these instruments when considering particular issues. It

also goes without saying that we have applied Part 2 of the RMA when considering the various issues.

[758] We begin our evaluation of the issues by considering each of the matters arising from s 104(1)(a) of the RMA that we have listed. After that we will address the remaining principal issues in contention

Geotechnical design and dam safety

[759] Twenty two submitters expressed concern about the proximity of the proposed dam to the Mohaka Fault and the hazard that would arise if the dam ruptured. Some alleged that the seismic risk had not been adequately investigated or considered. Others raised the possibility of unknown faults in the area.

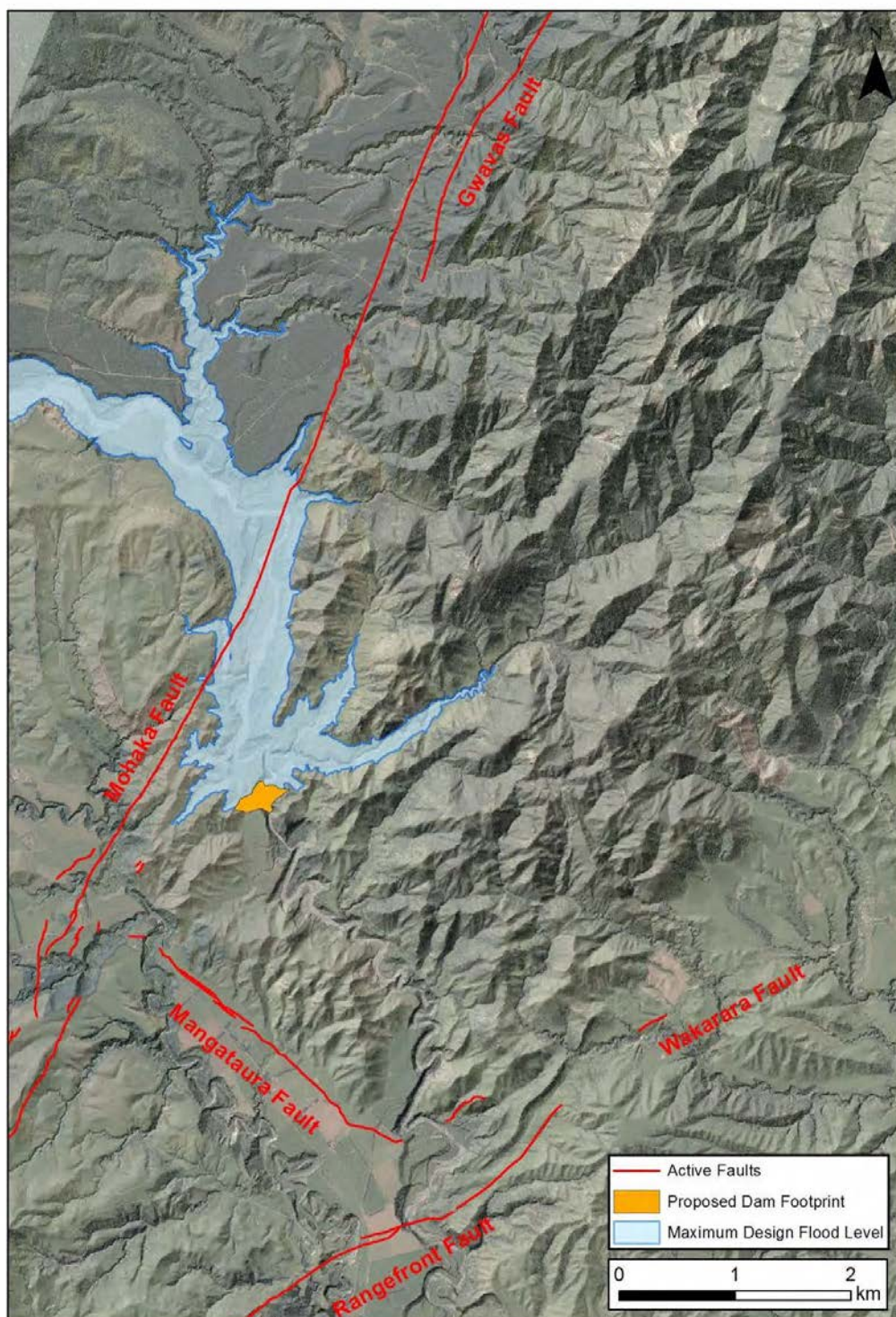


Figure 16: Earthquake Fault-lines in Vicinity of Dam⁴⁰³

⁴⁰³ P Villamor Perez, Evidence in Chief, page 23, Exhibit PV 1: Major active (earthquake) faults around the proposed dam site.

[760] HBRIC commissioned four studies relating to seismic issues which were undertaken by the Institute of Geological and Nuclear Sciences Limited (GNS). Dr Maria Pilar Villamor Perez, a geologist, was the lead author for three of the reports. She provided a brief of evidence confirming that the seismic studies undertaken for the RWSS feasibility study were “appropriate and consistent with international practice”. She also records that those studies confirmed “there is no evidence of active (earthquake) fault lines (capable of producing ground displacement of several metres) at the proposed dam footprint”.⁴⁰⁴

[761] The closest fault to the proposed dam site is the Mohaka fault which is about 800m away (Figure 16). That fault runs beneath the proposed reservoir. Dr Villamor Perez indicated that of the three faults that were located. This fault would produce the largest earthquake. However, it had not ruptured “during historical times”.⁴⁰⁵

[762] Dr Villamor Perez explained that the Mohaka Fault:⁴⁰⁶

“...has shown itself capable of producing earthquakes with a moment magnitude, or Mw, of 7.5 every c. 1125-1300/yr on average (Report 2, section 4.2; Report 1, section 4.1; and Stirling et al. 2012)...”

She said that she preferred not to use the Richter magnitude scale because for increasingly larger earthquakes it progressively under-estimated the actual energy release.

[763] For a Mw 7.5 rupture on the Mohaka Fault the expected average ground displacement would be 4.5m (+/- 1 m) laterally and up to 1m vertically at the fault itself. In other words, one side of the fault would move sideways by up to 4.5m and down by up to 1m, with respect to the other side of the fault.⁴⁰⁷

[764] During major earthquakes worldwide it has been observed that “small” displacements (usually less than 1m over distances of a few hundred metres to a few kilometres) occur close to the fault. This type of deformation is known as ‘secondary

⁴⁰⁴ P Villamor Perez, Evidence in Chief, paragraph 2.2(a) and (b).

⁴⁰⁵ P Villamor Perez, Evidence in Chief, paragraph 2.2(c) and (d).

⁴⁰⁶ P Villamor Perez, Evidence in Chief, paragraph 3.6(b).

⁴⁰⁷ P Villamor Perez, Evidence in Chief, paragraph 3.6(d).

rupture’. Investigation of the possibility of “secondary rupture” at the proposed dam footprint and at nearby sites revealed that there was no evidence of secondary displacement during at least the last 10,000 years.⁴⁰⁸

[765] In response to submissions expressing concern about the proximity of the dam to major earthquake fault-lines, Dr Villamor Perez commented:⁴⁰⁹

“...the proposed dam is located in a seismically active area because Hawke’s Bay, and, in fact, the whole North Island, is located at the boundary of two tectonic plates (Report 1, section 1.2.1). In the Hawke’s Bay region several active (earthquake generating) faults are mapped. There are three active fault-lines, the Mohaka, Wakarara and Mangataura faults, in the vicinity of the proposed dam site (Report 1, section 4)...”

She considered that the degree of seismic hazard had been identified and appropriately assessed and that the concerns raised by submitters should be considered “in the context of Hawke’s Bay and North Island faulting generally.”⁴¹⁰

Dam design

[766] Under the New Zealand Society of Large Dams Guidelines the proposed dam is classified as a dam with a “high potential impact”. This reflects that a failure would have a major or catastrophic effect placing more than 100 people at risk. As a result of this classification high design standards are specified, a dam safety assurance programme is required, and an emergency action plan has to be prepared.⁴¹¹

[767] A “dam break analysis” modelled the effects of a dam failure and the emptying of the reservoir. This indicated extensive and deep flooding downstream with 373 houses experiencing flooding to a depth of 0.5m or greater, and water levels of up to 3m in some places.⁴¹² The Board accepts that the assumptions underlying this analysis, especially the breach development time of 1 hour and a consequent peak outflow of 45,000 m³/s, are conservative.

⁴⁰⁸ P Villamor Perez, Evidence in Chief, paragraph 3.6(e) - (j).

⁴⁰⁹ P Villamor Perez, Evidence in Chief, paragraph 3.4.

⁴¹⁰ P Villamor Perez, Evidence in Chief, paragraph 3.7.

⁴¹¹ HBRC Engineering, Ruataniwha Water Storage Scheme – Dam Break analysis, May 2013, Ruataniwha Water Storage Scheme application documents, Folder 7, Tab 4, page 39, section 9.

⁴¹² HBRC Engineering, Ruataniwha Water Storage Scheme – Dam Break analysis, May 2013, Ruataniwha Water Storage Scheme application documents, Folder 7, Tab 4, page 37, section 8.

[768] Phillip Carter, a Civil Engineer with 47 years of dam engineering experience, much of it in New South Wales, Australia, was involved in the design of the dam. He explained that the CFRD was adopted because it provided the best solution for the site's geotechnical issues and the materials available. He noted that the dam would be constructed on a hard rock foundation⁴¹³.

[769] Mr Carter said the view that CRFD is "inherently resistant to seismic loading" is widely supported by dam engineering specialists and by organisations such as The International Committee on Large Dams. He explained that the dam would have to be capable of withstanding the "maximum design earthquake" (which is based on the "maximum credible earthquake") without uncontrolled release of the water in the reservoir.⁴¹⁴

[770] Dr Trevor Matuschka, a well experienced Civil Engineer with New Zealand and worldwide experience in dam design, peer reviewed both the choice of dam and its design. He considered:⁴¹⁵

"... investigations, design concepts and supporting analysis for the proposed Ruataniwha dam ... are robust, have been undertaken by people with appropriate experience and demonstrate the design will be fit for purpose. The dam has been designed and must be constructed, operated and maintained in accordance with the NZSOLD⁴¹⁶ guidelines under proposed conditions 21-25 of Schedule 2 of the consents. In this case I am confident that it will be safe and capable of passing extreme floods and surviving extreme earthquake events."

These words were expressly endorsed by Murray Gillon, another highly experienced dam designer who peer reviewed the proposed dam.⁴¹⁷

The Board's findings

[771] There is no expert evidence before the Board suggesting that the technical safety evaluation of the dam and its design is flawed in any way.

⁴¹³ P Carter, Evidence in Chief, paragraph 3.2.

⁴¹⁴ P Carter, Evidence in Chief, paragraphs 3.3–3.6.

⁴¹⁵ T Matuschka, Evidence in Chief, paragraph 3.19.

⁴¹⁶ New Zealand Society on Large Dams (NZSOLD)

⁴¹⁷ M Gillon, Evidence in Chief, paragraph 2.5.

[772] The Board accepts that a CFRD dam can withstand severe shaking, foundation displacement, and significant through-flow, all without failing. The proposed dam has been designed to withstand the maximum credible earthquake without releasing the reservoir. That event has an annual exceedance probability of 1 in 10,000 years. Moreover, for the reservoir to be released over the short period of an hour, a much more severe event (with a significantly reduced probability) would be required.

[773] Understandably there is apprehension about safety issues. But the evidence before the Board indicates that the risk (that is the probability and the consequences) of a catastrophic dam failure has been properly evaluated and (subject to what we are about to say) sufficiently reduced by the design of the dam and the obligations contained in the conditions. Provided the conditions concerning dam design are sufficiently robust, the issue of safety should not rule out the RWSS.

[774] During the hearing the question of an independent expert panel was raised by the Board. This reflected that the Board was concerned that the proposed conditions might not adequately cover the need for independent supervision of all aspects of the dam such as design, construction, commissioning, operation and maintenance. Mr Graeme Hansen, the RWSS Project Manager, told the Board that Tonkin & Taylor Limited had provided the expertise to date and that the Snowy Mountain Engineering Corporation was expected to provide expert services for the next phase.⁴¹⁸ When questioned by Commissioner Howie, Mr Hansen said that he did not have any inherent objection to a condition requiring an independent expert review panel.⁴¹⁹

[775] The Board is conscious that this is a very large dam retaining a substantial volume of water. It is also conscious that the dam is located in a seismically active area upstream of an urban area and a developed rural area, both with extensive infrastructure. While the Board accepts the competence of the experienced engineers that will be involved and the safety conscious provisions of the New Zealand Society on Large Dams Guidelines, it is conscious that every project of this nature has its own peculiarities that require timely expert evaluation and review.

⁴¹⁸ G Hansen, Tukituki Catchment Proposal Hearing Transcript, page 181.

⁴¹⁹ G Hansen, Tukituki Catchment Proposal Hearing Transcript, page 182.

[776] For those reasons the Board has revised the conditions relating to the construction of the dam to ensure that all aspects of investigations, design, construction, operation, maintenance are independently reviewed by a panel of at least three independent experts at appropriate milestones.

Water quality/Land use

[777] The effect of the RWSS on water quality was one of the central issues for the scheme. This reflects that good water quality is an essential value for freshwater ecosystems as it enables aquatic life, such as fish and macroinvertebrates to survive and reproduce. It also benefits human values, such as recreational (for example angling, swimming) and is important for agricultural use (for example stock water, irrigation). For Māori, water quality is an important aspect of the ‘mauri’ or life force of the river.

[778] With major dam constructions comes a range of ancillary issues affecting the environment. Some of these effects are temporary such as the effects on water quality as a result of construction. Others some arise from the permanent storage of water within the reservoir, discharge of water from the dam to the river, and from the ultimate use of water, for example from intensification of land use.

Effects of construction

[779] A report from the Cawthron Institute⁴²⁰ considered the effects of construction on water quality. It predicted that those effects would rapidly reduce once the work site is adequately stabilised but that the deposition of mobilised sediment downstream may have longer term effects that take 6–12 months for full recovery. Effects would be most significant close to the proposed dam site and have less influence downstream of the Waipawa and Tukituki confluences.

[780] Dr Death accepted that if the construction of the dam was undertaken with due care and using best management, these effects would have a relatively minor or short duration effect on aquatic invertebrates.⁴²¹ Expert witness conferencing produced a

⁴²⁰ Cawthron Institute, Ruataniwha Water Storage Scheme – Aquatic Ecology Assessment of Effects, Cawthron (May 2013, Ruataniwha Water Storage Scheme application documents, Key Reference Report, Folder 5, Tab 3.

⁴²¹ R Death, Evidence in Chief, paragraph 8.2.

consensus that the effects of the dam construction would be as reported in the Cawthron Report and that the combination of the Construction Environmental Management Plan and proposed conditions (including monitoring) would be an adequate way of minimising the effects of construction on the river ecology.⁴²²

[781] The Board finds that the effects of construction will be less than minor, provided construction is managed in accordance with the conditions of consent.

Effects of storage in the reservoir

[782] As part of the feasibility study for the proposed RWSS, the National Institute of Water and Atmosphere (NIWA) was commissioned to provide an assessment of the effects on water quality in the proposed reservoir.⁴²³ The scenarios modelled showed a broad range of water qualities in the reservoir.

[783] Based on the full volume of 90million m³ and a proposed mean annual discharge of 6.34m³/s,⁴²⁴ there would be a theoretical mean average time in the reservoir of 164 days. Movement of sediment down the river below the dam would be substantially reduced and this would enhance water clarity.⁴²⁵

[784] In general water quality in the reservoir is likely to be similar to the quality of the inflow water. However, biological processes that occur naturally in lakes may change the relative concentrations of some parameters. Unless an aeration system is used there would be oxygen depletion in the bottom waters.

[785] Water quality monitoring, including temperature and dissolved oxygen concentrations at all depths, was recommended. It was suggested that data collection techniques in the Ministry for the Environment Report (Burns et al. 2000 – Protocol for

⁴²² Expert Conferencing Joint Witness Statement to the Board of Inquiry – RWSS effects on aquatic ecology, 28 October 2013, paragraphs 1 and 2.

⁴²³ NIWA, Ruataniwha Water Storage Scheme - Characterisation of Makaroro Reservoir water quality, May 2013, Ruataniwha Water Storage Scheme application documents, Folder 5, Tab 2.

⁴²⁴ Tonkin & Taylor data provided for the Feasibility Study.

⁴²⁵ NIWA, Ruataniwha Water Storage Scheme - Characterisation of Makaroro Reservoir water quality, May 2013, Ruataniwha Water Storage Scheme application documents, Folder 5, Tab 2, page 7.

monitoring trophic levels of New Zealand lakes and reservoirs) should be adopted for the monitoring of the reservoir and that monthly sampling should be sufficient.⁴²⁶

[786] Conditions proposed for application NSP 13/02. 003 (WP120371M, Makaroro damming, take, diversion and discharge) set the water quality monitoring, management and reporting requirements for the reservoir. Dr Ausseil inferred to the Board that these conditions were developed from the suggestions as set out in the NIWA report.

[787] Condition 15 requires the implementation of a monthly water quality monitoring programme and the annual calculation of the Trophic Level Index based on four main trophic indicators: water clarity, chlorophyll a, total nitrogen and total phosphorus. Condition 16 requires the installation of an aerator. It also requires monitoring for utilisation of the aerator, whereby monthly depth profiles are compared to the temperature and dissolved oxygen levels determine when the aerator should be turned on.

[788] Dr Ausseil informed the Board that he had not identified any submissions raising concerns or queries in relation to these conditions specifically.⁴²⁷ That certainly appears to be the case.

[789] The NIWA report⁴²⁸ recommended a number of catchment management strategies:

- Removing all production forest trees within a buffer zone at least 25m from the predicted high water line of the reservoir and planting a buffer zone with native plants is recommended in order to reduce sediment runoff into the reservoir;
- All roading infrastructures near the reservoir that will be required for the future harvesting of the remaining forest should be constructed at the same time;

⁴²⁶ NIWA, Ruataniwha Water Storage Scheme - Characterisation of Makaroro Reservoir water quality, May 2013, Ruataniwha Water Storage Scheme application documents, Folder 5, Tab 2, page 69.

⁴²⁷ O Ausseil, Evidence in Chief, paragraph 17.10.

⁴²⁸ NIWA, Ruataniwha Water Storage Scheme - Characterisation of Makaroro Reservoir water quality, May 2013, Ruataniwha Water Storage Scheme application documents, Folder 5, Tab 2, page 67.

- Removal of vegetation for land clearance of steep land (>20 degrees) within the reservoir catchment should be controlled by a resource consent;
- prior to harvesting of production forest on steeply sloping land, sediment management plans be provided and approved by HBRC;
- Consideration be given to management of exotic macrophytes and pest fish through a campaign of prevention. For example, notices about cleaning boats and boat trailers before entering the lake, and warnings about the introduction of pest fish, exotic snails and plants from aquaria, could be posted at public access points and public amenity facilities.

Those recommendations have also been incorporated in the proposed conditions.

[790] Given the conditions relating to the reservoir the Board accepts that any changes in water quality associated with storage of water within the reservoir will be less than minor. Steps will be taken to properly manage the land that will be inundated. Water quality will be continuously monitored and an aerator is to be installed. No problems are anticipated with levels of dissolved oxygen, nutrients and sediment released downstream from the reservoir.

Effects arising from the use of water for irrigation

[791] This type of effect on water quality was raised by many submitters. Their concerns were not so much about any direct consequences of the construction or operation of the RWSS, but more about the risk of adverse environmental effects arising from intensified land use as a result of the availability of irrigation water.

[792] The Board agrees that farming intensification is an inevitable consequence of the RWSS. EDS, Fish and Game, Forest and Bird, NKII, Heretaunga, and other submitters expressed deep concern that this intensification would cause a substantial increase in nitrogen leaching which would mean that the RWSS would not promote sustainable management. Although this risk was acknowledged by HBRIC, its response was that management of the risk was an important component of the integrated management

strategy for the Tukituki catchment. The key mechanisms for implementing this strategy are PC6 and the RWSS itself.

[793] Relevant aspects of PC6 have already been traversed in Part 2 of this report. Suffice to say at this stage that when the Board set the nitrogen (and phosphorus) limits in PC6 it was well aware of the concerns about land use intensification. The Board had received a good deal of evidence on that topic, including the ability of farming practices to accommodate the nutrient controls that were set. The Board was satisfied that the farming industry can operate within the parameters of nitrogen and phosphorus limits that were set in PC6.

[794] Turning to the RWSS itself, the Irrigation Environmental Management Plan (IEMP) is the key mechanism for addressing water quality issues⁴²⁹. This Plan manages the interaction between irrigation (by users within the scheme) and the PC6 water quality regime in the Tukituki catchment. A finalised IEMP is to be delivered at least six months prior to the first supply of irrigation water from the scheme.

[795] A document called the RWSS Irrigation Environment Management Plan was lodged with the EPA as part of the application for consent. This document was necessarily in draft as the final form of any IEMP depended on the finalisation of PC6 by the Board.

[796] It was explained in the applicant's draft IEMP that in relation to water quality:

“HBRIC Limited plans to adopt suitable limits and practices to maintain a high environmental quality in surface and sub-surface aquifers.”⁴³⁰

Various water quality provisions in PC6 as notified were mentioned and it was indicated that the IEMP was committed to meeting the environmental parameters specified in PC6.

⁴²⁹ arising from land use intensification

⁴³⁰ Hawke's Bay Regional Investment Company Ltd, Ruataniwha Water Storage Scheme – Irrigation Environmental Management Plan Draft, May 2013, Ruataniwha Water Storage Scheme application documents, Folder 3, Tab 5, page 8.

[797] The Draft IEMP then states⁴³¹:

“Where, at any of the monitoring sites the in-stream annual medium and/or 95th percentile nitrate – nitrogen concentrations measured by HBRC (or by the scheme, as the case may be) are greater than 80% of the limits in Table 2 (Plan Change 6) there will be an immediate requirement for HBRIC Ltd (as consent holder) to undertake modelling and comparison of nitrogen outputs that are currently measured with those modelled as the current land use scenario as at 6 May 2013.”

Thus the IEMP seeks to implement good farming practices in respect of both nitrogen and phosphorus nutrient management.

[798] In the course of the conferencing between the planning expert witnesses on the issue of RWSS conditions of consent, substantial agreement was reached with all of the participants about the appropriate conditions of consent, including the conditions relating to the IEMP and the FEMPs. Mr Percy was the only expert in attendance not to agree to all the conditions.

[799] The joint witness statement records that, due to the short time frame for conferencing, substantive matters raised by Mr Percy (a planner who gave evidence for Fish and Game), were not able to be discussed or resolved prior to conferencing. In particular, the joint witness statement records that Mr Percy does not agree with the approach taken in PC6 to water quality and therefore does not agree with the current suite of conditions relating to water quality in the notified version of PC6⁴³².

[800] As will be evident from the Board’s decisions in relation to PC6, it sees the implementation of FEMPs as fundamental to the implementation of the PC6 provisions, and in turn to the achievement of the objectives of the NPSFM. This is not only within RWSS scheme area, but throughout the Tukituki catchment.

[801] There was substantial agreement from the broad spectrum of submitters that the use of FEMPs (including Nutrient Budgets, phosphorus management plans and other

⁴³¹ Hawke’s Bay Regional Investment Company Ltd, Ruataniwha Water Storage Scheme – Irrigation Environmental Management Plan Draft, May 2013, Ruataniwha Water Storage Scheme application documents, Folder 3, Tab 5, paragraph 4.3.2.

⁴³² Expert Conferencing Joint Witness Statement to the Board of Inquiry –Planners RWSS Consent conditions, 6 November 2013, page 3.

matters as detailed in the schedules to PC6) is desirable both from a farm management perspective and for nutrient management. The requirement for the RWSS consent holder to prepare an IEMP is consistent with both good farm management practice and sustainable management under the RMA.

[802] There was substantial agreement between the expert witnesses called for all parties on the appropriateness of the consent conditions. The only witness apparently unable to agree on appropriate consent conditions was Mr Percy. As noted in the evidence of Claire Mulcock (on behalf of the applicant), Mr Percy's concerns were considered and, where appropriate, amendments to conditions were made. Many of the issues on which Mr Percy found he could not agree flow from a disagreement with the approach in PC6 rather than any concerns about the way that the IEMP and FEMP would be used within the RWSS.

[803] In the end result the Board believes that the expert evidence strongly favours the approach adopted by the RWSS. In particular, we find that the requirement to prepare FEMPs and for the consent holder to provide further management and oversight of land uses within the scheme area by way of the IEMP is appropriate. While farming intensification will be an inevitable consequence of the RWSS, such intensification will have to satisfy the strict controls now imposed by PC6.

Land use

[804] If the RWSS is to be approved there will be intensification of farming practices within the catchment area. Land use intensification was supported by some and opposed by others.

[805] As part of the consents requested by the applicant the applicant has applied for Land Use consent (LU120382L). The activity for which consent is sought is described as:

“Use of production land pursuant to section 9(2) of the RMA within the Tukituki River catchment within the Ruataniwha Water Storage Scheme (a Community Irrigation Scheme) Area identified as zones A-D to the west of Waipawa and Waipukarau and as Zone M to the East of Waipawa in Plans 1, 8 and 9 in Schedule 4”

No further detail as to precisely what the use of production land was going to be was contained in the application.

[806] As the Board understand the application, it is effectively asking for a land use consent on the basis that the activities as a whole would be required to comply with a series of conditions. Essentially those conditions would require the consent holder to comply with the water quality standards for permitted activities under the provisions of PC6 as proposed.

[807] It goes without saying that the production land to which this application relates will almost certainly comprise a large number of individual farm properties. No resource consent would be required if those properties individually met the standards for permitted activities.

[808] In applying for a land use consent for the aggregated land area within the scheme, the applicant appears to be asking the Board to consider the activities as a composite package. This seems to be on the basis that it would be the responsibility of the consent holder (the applicant) to meet the standards for permitted activities under PC6.

[809] This approach offers advantages and disadvantages to the consent holder and the individual farms within the scheme. As proposed the conditions offered by the applicant cover a monitoring and contractual compliance regime that is additional to the equivalent provisions of PC6. Mr Daysh referred to this regime as establishing “a suitable water quality adaptive management regime which... responds to the water quality limits and target policy and rule regime set out under Change 6”⁴³³. As monitoring suggests that limits in PC6 are being approached, conditions require investigation by the consent holder and review of farm systems and FEMPs are triggered.

[810] The advantage for the consent holder and individual farms within the scheme is that use of the production land would be allowed under the ‘umbrella’ provided by the

⁴³³ See EIC at 8.21.

consent sought. Importantly, this would allow ‘averaging’ over the entire consent area. If one farm activity within the scheme is unable to comply with the permitted activity standards, but another has some ‘head room’, one could be offset against the other.

[811] However, this would go well beyond the averaging authorised under PC6 for a “farming enterprise”. Before properties can qualify as a farming enterprise they have to be farmed “as a single farming operating unit”. Consequently the Board has concluded that averaging across the whole scheme would undermine PC6 and thereby compromise sustainable management under the RMA.

[812] On the other hand the Board accepts that averaging over farms within the scheme which are within the same surface water catchment zones delineated in schedule XVI would be consistent with both the Act and PC6. In effect those within the scheme would be treated as a ‘farming enterprise’.

[813] If granted the land use consent sought in LU120382L would be on the basis that it is subject to conditions that reflect PC6 as it now stands.

Effects on water quality of the changed flow regime downstream of the dam

[814] The discussion that follows concerns the general effects on water quality. Specific effects on such things as aquatic ecology will be considered separately.

[815] Substantial changes to the flow regime downstream of the dam will result from the RWSS. In the reach between the dam and the upstream irrigation intake there will be higher flow in the summer irrigation period and lower flows in late autumn and winter. Flood frequency will be reduced particularly during late autumn and winter.

[816] Downstream of the irrigation intake there will be a general reduction in median flows throughout the year as a result of the scheme, but an increase in the lowest flows. The general reduction in median flows downstream of the irrigation intake will reduce the capacity of the river to dilute contaminants at moderate flows. On the other hand, the increase in minimum flows will result in an increase in dilution of contaminants at low flows.

[817] The frequency of flood flows capable of flushing periphyton will be reduced, particularly during the irrigation season and during late autumn/winter when the reservoir will be refilling. However, the scheme incorporates four flushing flows per irrigation season to aid the management of nuisance periphyton growth. These flushing flows are promoted as an environmental benefit of the scheme that is not available under the status quo.

Water quantity

[818] In terms of the wise use and management of resources and effects on the environment it is important to address various matters concerning water quantity. These include the ability of the reservoir to meet irrigation and environmental demands, whether the reservoir can be refilled during periods of higher flow, sediment transport, fluctuating water levels in the reservoir, and floods.

[819] Modelling of the reservoir operation and discharge regime has been on the basis that ‘tranches’ of water will be released from the dam in the following order of priority (highest to lowest):⁴³⁴

- “a primary residual flow at the toe of the dam of 1.23 cumecs at all times. This is 90% of the mean annual low flow at the dam site;
- two ‘primary’ flushing flows of up to 2million m³ per irrigation season;
- a ‘primary’ irrigation volume of up to 95.8million m³ during the irrigation season;
- two ‘secondary’ flushing flows of up to 2million m³ per irrigation season;
- a ‘secondary’ irrigation volume capped at 28million m³ per irrigation season.”

For the purposes of this regime an ‘irrigation season’ is described as the period between 15 December and 30 April⁴³⁵.

⁴³⁴ D Leong, Evidence in Chief, paragraph 8.2.

Accuracy of hydrological calculations

[820] When calculating the ability of the storage facility to meet demands on the water the HBRIC's hydrologist, David Leong of Tonkin & Taylor Limited, used measured and synthesised flow data over a 36 year period (coupled with assessments as to irrigation and other demands for the water). He calculated that with a gross water storage capacity of 90.7million m³ the scheme could meet all the demands during droughts of up to an eleven year return period. That assessment took into account evaporation, distribution system losses, sedimentation in the reservoir and inflows during the irrigation season.

[821] Some submitters who opposed the scheme considered that the flow records used by Mr Leong were unreliable and that the water resource available for irrigation and environmental uses had been over-estimated. Dr Zemansky, who presented evidence for Fish and Game, disputed the accuracy of the enhanced flow record on the Makaroro River at the Burnt Bridge site. He believed that the enhanced flow record was likely to be significantly higher than the actual stream flow and that the viability of the scheme was questionable.⁴³⁶

[822] The nearest gauged river flow site to the proposed dam is at Burnt Bridge on the Makaroro River, some 10km downstream of the dam site. It has flow records from 1975 to 1991. Since that time water levels have only been kept for flood warning purposes. A long term flow record for the site was derived from the existing flow records at Burnt Bridge which were adjusted to reflect other gauged sites in the catchment and measured rainfall. Mr Leong described the detailed methodologies and his responses to the peer review of Dr David Painter.

[823] The outcome, adjusted so as to relate to the dam site, gave a long term mean flow of 6.36m³/s which Mr Leong considered was accurate to within +/- 10%.⁴³⁷ This conclusion is important because it provides the measure of the water resource available to fill the reservoir and supply the demands for irrigation and environmental flows. The

⁴³⁵ NSP 13/02. 003 - (HBRC WP120371M), condition 13 to 14.

⁴³⁶ G Zemansky, Evidence in Chief, paragraph 2.2.

⁴³⁷ D Leong, Evidence in Chief, paragraph 2.2.

Board apprehends that after allowing for a continuous minimum flow of 1.23 m³/s it would take 205 days for 90.7million m³ to accumulate.

[824] Both Mr Leong and Dr Zemansky agree that the Burnt Bridge gauging site has significant shortcomings. However, at expert conferencing they agreed that while the site may not be ideal, there were limited options with regard to ease of access and river morphology. It was agreed that shortcomings at the gauging site could affect the accuracy of the data.⁴³⁸

[825] Among the difficulties with the gauging site is the moveable nature of the riverbed which presents difficulties in maintaining a consistent rating curve. However, the experts agreed that there have been a significant number of river flow gauging's and that efforts have been made to adjust the rating curves.

[826] Questions about the adequacy of river flows at the dam site were also raised by other submitters. For example Colin Riden, an analyst with systems and data backgrounds, presented a representation which included a very long and complicated series of numerical analyses of flows in the Makaroro River. He concluded that the mean flow is less than 5 m³/s and that flows at that level would be insufficient for the scheme to operate effectively. Those analyses were not tested at the hearing and there was no rebuttal evidence for us to consider. We understand that Mr Riden discussed his concerns with Mr Leong and Mr Waldron who did not seek to change their estimates.

[827] Having assessed the evidence on this topic the Board have concluded that Mr Leong's estimates of river flow at the dam site have been carefully formulated and are accurate. The Board found Mr Leong's rebuttal of the points raised by Dr Zemansky particularly persuasive. We have not been persuaded that there is a serious flaw in his calculations.

⁴³⁸ Expert Conferencing Joint Witness Statement to the Board of Inquiry - Water Science and Hydrology, 16 October 2013, paragraph 4.1.

Irrigation Demand

[828] Mr Leong also provided evidence about his assessment of the irrigation demand. For this purpose he used the five irrigation Zones (A–D and M) as the ‘command area’ for the proposed scheme.

[829] When making his calculations Mr Leong assumed that 70% of the gross area in Zones A–D, totalling 22,330ha, was irrigable.⁴³⁹ He also assumed that pasture would represent the land use on the irrigable land (said to be conservative because of the high seasonal demand pasture has for water) and that the service level would be 85% of maximum demand. Mr Leong estimated that the average water demand over the Ruataniwha Plains would be 453mm/year, which represents an annual total volume of just over 101million m³.⁴⁴⁰

[830] According to Mr Leong’s calculations the storage behind the dam would be able to supply irrigation water to 17,120 ha.⁴⁴¹ He believed that this is a minimum area because of the underlying assumptions about pasture cover, high reliability of supply, and moderate irrigation efficiency. He also believed that a command area greater than 17,120ha could be achieved if farmers chose to irrigate less than 70% of their irrigable land and there were mixed land use (which would need less water).

[831] Zone M was assessed separately. Some 1.77m³/s for peak irrigation demand and 50l/s as a residual flow (a total flow of 1.82m³/s) is to be provided from the storage scheme via the Waipawa River. The Board does not seem to have been told the irrigable area in Zone M. However, taking Mr Leong’s figures of 5mm/day⁴⁴² as the peak daily rate and then using the flow of 1.77m³/s, the Board has calculated that the irrigable area in Zone M would be about 3060ha.

[832] Given that information the Board proceeds on the basis that the total command area for the scheme would be 25,390ha (22,330ha plus 3060ha). Assuming peak demand and a high level of reliability, up to 8270ha within the command area would not

⁴³⁹ D Leong, Evidence in Chief, paragraph 4.6.

⁴⁴⁰ D Leong, Evidence in Chief, Table 1, page 10.

⁴⁴¹ D Leong, Evidence in Chief, paragraph 6.16.

⁴⁴² D Leong, Evidence in Chief, paragraph 4.6 (e).

be supplied from the RWSS. Alternatively all the land commanded could be supplied if peak demands are less and the reliability of service is lower.

[833] Now that PC6 permits additional deep groundwater abstraction in the Ruataniwha Plains for irrigation (up from 28.5million m³/year to 43.5million m³/year) an area of 12,659ha could be irrigated from that source.⁴⁴³ Thus it should be possible to reliably irrigate about 29,779ha using both stored water and deep groundwater (17,120ha plus 12,659ha). However, neither stored water nor groundwater would *alone* be able to reliably irrigate that area. Both sources would be required.

[834] The material before the Board includes other references to the irrigable command area. Mr Maxwell referred to a scheme irrigation command area of 31,289ha in Zones A–D and in M. That included 25,000ha of new irrigation to be serviced by the RWSS and the 6289ha currently irrigated. Mr Maxwell also mentioned a further 46,000ha that would undergo some land use change as a result of the RWSS.⁴⁴⁴

[835] For his economic analysis Mr Macfarlane adopted 25,000ha in Zones A–D and M as the area to be irrigated.⁴⁴⁵ He referred to a further 17,000ha having a supportive role. We also note that in the preamble of the AEE reference is made to storage for a reliable irrigation supply to 25,000 to 30,000ha.

[836] All of these figures seem to be early estimates. They appear to have been used in a general sense or for the purpose of predicting nutrient leaching as a result of intensification of land use or for the purpose of economic analysis. Whatever the explanation, the Board is satisfied that they do not undermine the analysis that was undertaken by Mr Leong or the conclusions the Board has reached on the strength of his evidence.

[837] In the Board's view there is a reasonable correlation between the water proposed to be stored and the irrigation demand for that water.

⁴⁴³ With 1.2million m³ from deep groundwater used to supplement low flows in the Waipawa and Upper Tukituki Rivers the irrigable area reduces slightly by some 250 ha.

⁴⁴⁴ I Maxwell, Evidence in Chief, paragraph 6.8.

⁴⁴⁵ A Macfarlane, Evidence in Chief, paragraph 4.1(d) and (e).

Environmental demands on the stored water

[838] As we have already mentioned, three tranches of water are to be released from storage for environmental purposes.

[839] The first is the release of water from the dam into the Makaroro River to maintain a minimum flow at the dam of $1.23\text{m}^3/\text{s}$ which is to be maintained at all times.⁴⁴⁶ Flows below the dam are expected to be at this minimum flow for 35% of the time which represents a significant ‘flat lining’ of the low flow in the Makaroro River, although for 3% of the time the minimum flow would be above that which would have occurred naturally.⁴⁴⁷

[840] Next there is the release of 2million m^3/year (to be released in two flushes). This is designed to alleviate the periphyton nuisance in the Tukituki River during warm summer low flows and to freshen the water quality. A flow of up to $30\text{m}^3/\text{s}$ is to be released in each flush and the flush is to be timed to reinforce any natural flushes in the river.

[841] Finally, a further 2million m^3 of water is earmarked for two additional flushing flows. As Mr Leong originally explained the priorities, these two additional flushing flows would be subject to the availability of water after the primary irrigation demand had been met. However, this does not seem to be the way that the relevant condition has been formulated, and we will return to this matter.

[842] The first environmental effect that we need to consider is the ‘flat lining’ that will occur at times of low flows. Dr Hayes, the Senior Freshwater Scientist at the Cawthron Institute, explained:⁴⁴⁸

“Water storage schemes allow the opportunity to design flow regimes such that flood frequency can be decreased and minimum flows enhanced to benefit benthic productivity – and potentially fish. But this requires a careful assessment of flushing flow requirements and the interplay between the minimum flow and allocation rate on fish and benthic invertebrate habitat. The result could be flat lining at high minimum flow interspersed with sufficient

⁴⁴⁶ D Leong, Evidence in Chief, paragraph 8.3.

⁴⁴⁷ D Leong, Evidence in Chief, paragraph 8.14.

⁴⁴⁸ J Hayes, Evidence in Chief, paragraph 3.11.

floods to prevent nuisance periphyton blooms. So flat lining at the minimum flow is not necessarily bad – it depends on the circumstances. That said, there is inadequate knowledge of the effects of holding flows at the minimum for various periods of time. The risk of adverse effects increase with decreasing minimum flow, increasing duration of minimum flow, and increasing allocation volume.”

Clearly periods of flat lining are unavoidable, but that should be balanced against the benefits of the minimum flows that have been set and the flushing flows. The Board does not believe that flat lining in the stretch of the Makaroro River below the dam will be a problem.

[843] Another potential adverse effect relates to the consent holders who are tied to minimum flows at Red Bridge. This effect has been addressed by Condition 8 for Consent NSP 13/02. 003 (WP120371M). As a result of this condition HBRIC is required to ensure that the security of supply to the holders of resource consents subject to minimum flows at Red Bridge are not adversely affected by an increase in the number of days on which that minimum flow restricts exercise of those consents.⁴⁴⁹ If necessary additional water will have to be released from the dam to avoid the potential effect.

[844] That brings us to the issue of ‘flushing flows’. The relevant conditions implementing this regime are:⁴⁵⁰

12. The consent holder shall release water from the dam up to a maximum of 1million cubic metres for each release, with the objective of mitigating the build-up of periphyton downstream (flushing flows). These flushing flows shall occur up to four times during the period 15 December and the following 30 April each year.
13. Water released during flushing flows shall not be taken under Resource Consent WP120373T or WP120375T for irrigation and/or water supply purposes downstream. The discharge of flushing flows pursuant to this condition shall be undertaken in accordance with the following requirements:
 - (a) No flushing flows are required to be released while flows measured at the HBRC flow monitoring site at Red Bridge exceed 50 m³/s (the ‘trigger flow’) or within the period of 20 days thereafter;

⁴⁴⁹ Condition 8 of NSP 13/02. 003 (WP120371M) of RWSS consent conditions dated 20 January 2014.

⁴⁵⁰ Conditions 12 and 13 of NSP 13/02. 003 (WP120371M) of RWSS consent conditions dated 20 January 2014.

- (b) Between 20 days and 30 days following a trigger flow event, if the measured flow at Red Bridge exceeds 15 m³/s as a result of natural freshes in the river system, the consent holder shall release a flushing flow for a period of 9.25 hours. The flushing flow shall be the lesser of 30 m³/s and the difference between 50 m³/s and flow recorded at Red Bridge at the commencement of the flushing flow release;
- (c) If no flushing flow release is made under condition 13b) within 30 days of the last trigger flow, the consent holder shall release a flushing flow of 30 m³/s for a period of 9.25 hours; and
- (d) Where the Dam is unable to physically release the flushing flow required in conditions 13 a) to c) above, the flow that is able to be released shall be released over a proportionately longer period, up to a maximum of 12 hours, so that one million cubic metres is released during any flushing flow.
- (e) At least five working days prior to conditions 13 c) or 13 d) being triggered, the consent holder shall provide a “Release Proposal” prepared by a suitably qualified person to the HBRC Group Manager, Resource Management for certification that it meets the objective and contains the matters outlined below:

On our reading of these conditions the flushing flows have priority over irrigation uses of the water. In our view this is appropriate.

[845] The practical ability of the flushing flows to ‘piggy-back’ on natural freshes generated in other parts of the catchment was questioned by Ms McArthur and Dr Zemansky. This issue was discussed at expert conferencing and agreement was reached that the proposed piggy-back operation could be achieved if an effective flow forecasting system was implemented.⁴⁵¹

[846] Mr Leong noted in his evidence that HBRC already had an operational flood forecasting system that can predict flood flows and flood levels at Red Bridge in ‘real time’. He advised that it would be possible to adapt and enhance the existing system to focus on reliably forecasting medium to moderate high flows at Red Bridge.⁴⁵² We support that suggestion.

⁴⁵¹ Expert Conferencing Joint Witness Statement to the Board of Inquiry - Water Science and Hydrology, 16 October 2013, paragraph 28 and 29.

⁴⁵² D Leong, Rebuttal Evidence, paragraphs 4.1 and 4.2.

[847] The Board accepts that the dam would have the capacity to provide the minimum flows and flushing flows earlier discussed and this will benefit the aquatic health and amenity of the Makaroro River below the dam.

Extent of the Reservoir

[848] Effects arising from the size of the reservoir will be considered with reference to other topics including terrestrial/aquatic ecology and landscape.

[849] At this stage we simply note that a dam at the site chosen, coupled with the need for storage of 90.7million m³/year, and the shape of the upstream river valley, means that the full storage water level will be RL 469.5 m. That is the level stated in Condition 5 to the Consent NSP 13/02. 003 (WP120371M)⁴⁵³. The reservoir will flood some 370ha, including Dutch creek and a small area of conservation land. Fortunately, however, it does not extend into the Makaroro Gorge which is a feature that should be preserved.

Lake level fluctuations

[850] Again this matter will be covered in more detail with reference to dust and landscape. The Board's purpose in mentioning it at this stage is to explain the conclusions reached by Mr Leong as to fluctuations that are likely to occur in lake levels.

[851] Modelling based on the flow records indicates that for 90% of the year the lake level would be above RL 446 m⁴⁵⁴ (or a draw-down of up to 23.5m). During the summer period the lake level would be above RL 451m (or a draw-down of up to 18.5m) for 90% of the time. Autumn is the period of greatest draw-down when for 90% of the time the lake level will be above RL 432m (or a draw-down of up to 37.5m).

⁴⁵³ Condition 5 of NSP 13/02. 003 (WP120371M) of RWSS consent conditions dated 20 January 2014.

⁴⁵⁴ D Leong, Evidence in Chief, attachment DL13.

Sediment transport

[852] Obviously placing a dam in the Makaroro River will interrupt the flow of sediment in the river. The sediment will be trapped in the reservoir and the river flow in the Makaroro downstream of the dam will be devoid of sediment. However, the effect below the confluence of the Makaroro and Waipawa Rivers will be much reduced because the Waipawa River (and further down, the Tukituki River) will continue to carry sediment from its headwaters.

[853] Dr Timothy Fisher, a specialist engineer in environmental hydraulics at Tonkin & Taylor Limited (for HBRIC), estimates “based on a mid-point sedimentation rate of 205,000 m³/year there will be 4million m³ of sediment in 20 years and 7.2million m³ in 35 years.”⁴⁵⁵ Due allowance has been made for that factor when calculating the storage capacity of the reservoir. Over time its capacity will gradually decline and if irrigation demands are sufficient there may be a need in the future to excavate some of the deposited sediment and gravel from the reservoir.

[854] Changes in movement of sediment down the river will be most pronounced between the dam and the confluence of the Makaroro/Waipawa Rivers, a distance of 12km. Dr Fisher indicated that this reach of the river “...is characterised by gravel bed substrate. It is laterally confined within a valley. Where width permits, the river has multi channels. Elsewhere in narrower parts of the valley, the river has channel and bar sequences”.⁴⁵⁶

[855] Without its natural sediment load the flow in this reach of the river would erode sediment from the river channel leaving behind the larger gravel. Initial deepening of the river channel would occur until it is armoured by the larger gravel and stones. Flows will also be altered as water is stored, particularly in autumn and winter, and released in spring and summer.⁴⁵⁷

⁴⁵⁵ T Fisher, Evidence in Chief, paragraph, 7.1.

⁴⁵⁶ Hawke's Bay Regional Investment Company Ltd, Ruataniwha Water Storage Scheme – Sedimentation Assessment, May 2013, Ruataniwha Water Storage Scheme application documents, Folder 7, Tab 5, section 3.4.2.

⁴⁵⁷ T Fisher, Evidence in Chief, section 8.

[856] Dr Fisher explained:⁴⁵⁸

“These effects will be mitigated to some extent by the reduction in sediment transport due to the armouring and the reduction in flood flows. However, the reduction in flood flows will reduce the ability of the flows to erode vegetation. The encroachment of vegetation will likely reduce the channel width and form. The river will trend towards fewer channels. The proposed flushing flows will help to maintain the width of the river channels.”

Consequently there would be changes to the channel of the Makaroro River, some positive and others adverse, which need to be taken into account when assessing the RWSS. On balance the Board is satisfied that the changes on this reach of the river are acceptable.

[857] EDS claimed that the changed flow and sediment regime would have adverse effects on the braided river habitat.⁴⁵⁹ This matter was addressed in the experts’ conference report⁴⁶⁰ where the experts agreed with the Young et al 2013 assessment:

“The reduction in bed aggradation, due to sediment retention in the proposed dam, is likely to result in a reduction of gravel extraction from the channel, and associated reduction in habitat disturbance. This is likely to have a net benefit to the aquatic ecosystem. The coarsening of the bed substrate is also likely to have a net benefit for many species of native fish which prefer coarse substrates. However, bed coarsening and armouring will potentially increase the suitability of habitat for nuisance periphyton growth and reduce the availability of suitable spawning gravels for rainbow trout downstream of the dam.”⁴⁶¹

Taking all these matters into account the Board believes that there will, if anything, be an overall benefit in terms of aquatic ecosystems. While there might be a risk of increased periphyton growth, the periphyton problem tends to be more serious further downstream.

[858] Dr Fisher indicated that sedimentation interruption arising from the dam would slow, or possibly bring to an end, the aggradation that is currently occurring in the Waipawa reach downstream of the confluence with the Makaroro River.⁴⁶² At present

⁴⁵⁸ T Fisher, Evidence in Chief, paragraph 2.6.

⁴⁵⁹ McArthur evidence in chief at paragraph 160.

⁴⁶⁰ Expert Conferencing Joint Witness Statement to the Board of Inquiry – RWSS effects on aquatic ecology, 28 October 2013, paragraph 23.

⁴⁶¹ Cawthron Institute, Ruataniwha Water Storage Scheme - aquatic ecology assessment of effects, May 2013, Ruataniwha Water Storage Scheme application documents, Folder 5, Tab 3, page iv.

⁴⁶² T Fisher, Evidence in Chief, paragraph 8.5.

the surplus of gravel in the Waipawa River (and also the Tukituki River) is managed by gravel extraction.⁴⁶³ The Board does not see a small reduction in the supply of gravel as a significant issue. To the contrary there is probably a positive benefit to the extent that reduced extraction is likely to mean less disturbance to terrestrial and aquatic life.

[859] On the other hand there will be an adverse effect at the coast. A reduction of 1700m³/year in the sediment arriving at the river mouth is predicted. Given the coastal erosion is already occurring along this part of the coastline, any reduction in the supply of gravel can only be regarded as significant. This is to be mitigated by the supply of 3400m³/year of sediment to the coast, half to each side of the river mouth.

[860] Under Conditions 18–22 of Schedule 2 a Sediment Management Plan (SMP) is to be prepared before filling of the reservoir commences. This Plan will cover the supply of sediment to the coast at the rates given above. The sediment is to be sourced from the river as it becomes available and any effects of the scheme on the coastal form are to be monitored. The Board considers that these conditions are satisfactory.

Floods

[861] The final aspect of water quantity concerns the management of floods at the dam. It also relates to dam safety.

[862] Peak flood flows and flood volumes have been estimated by Mr Leong for the dam site. The 100, 1000 and 10,000 year return period floods lie between 340–566 m³/s with 48 hour flood volumes of between 32.6–55.3million m³. Climate change factors are estimated to increase these figures by 10–12%. The dam spillway has been designed to accommodate the Probable Maximum Flood which is based on the Probable Maximum Precipitation. The Probably Maximum Flood is very rare having a peak flow estimated at 800 m³/s and a return period of some 1.5million years⁴⁶⁴.

[863] A concrete spillway is to be built on the true right bank with an ogee weir outlet at the full supply level of RL 469.5m. The maximum elevation of the dam structure is

⁴⁶³ T Fisher, Evidence in Chief, paragraph 6.1.

⁴⁶⁴ D Leong, Evidence in Chief, paragraph 11.6.

the top of the parapet wall on the crest at RL 475.5m. An overflow spillway is to be formed on the true left bank at a higher elevation of RL 472.75m. Together they can pass the Probable Maximum Flood with a maximum flood level of RL 474.40m. This is a requirement of the New Zealand Dam Safety Guidelines for a dam in the high potential impact category.

[864] During construction, a diversion capacity of up to the 1000 year return flood is to be maintained where there is any risk to public safety or downstream damage.

[865] There were no significant challenges to these design parameters and we accept them.

Roading, traffic, noise and dust

[866] It is convenient to consider these effects together. They will be considered in the context of both construction and the ongoing operation of the RWSS.

Roading and traffic

[867] A Road Infrastructure and Traffic Assessment Report (May 2013) by OPUS International Consultants Limited (OPUS) identified two potential environmental effects: first, the suitability of the roading network affected by the RWSS in terms of adequate pavement strength and geometric alignment; secondly, structural capacity of existing bridges affected by the scheme.⁴⁶⁵

[868] In New Zealand terms the construction of the dam and associated works is a large project. Existing roading will need to be maintained or enhanced to accommodate increased traffic movements. Large trucks and machinery will be required on site while trucking and vehicle movements in the vicinity of the dam will increase exponentially. A number of existing bridges will be required to withstand heavy loading. Vehicles are also likely to have an impact on road surfaces, particularly where there are single coat seals. Some existing access forestry roads and farm access tracks will become flooded

⁴⁶⁵ OPUS, Ruataniwha Water Storage Scheme – Road infrastructure and traffic assessment, May 2013, Ruataniwha Water Storage Scheme application documents, Folder 7, Tab 1, paragraph 1.1.

and potential realignment and alternative access routes will need to be identified and constructed.

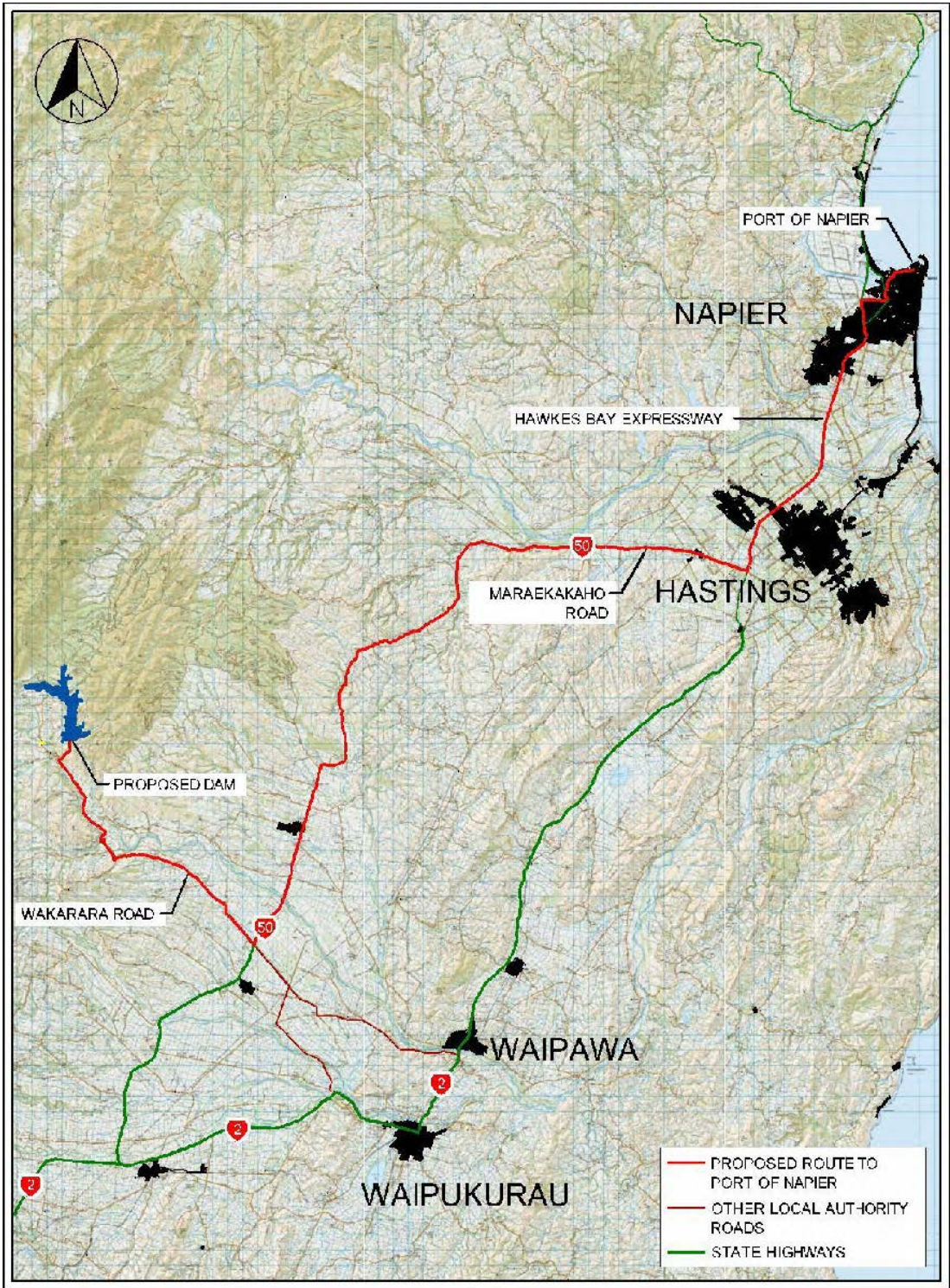


Figure 17: Potential Construction Traffic Routes⁴⁶⁶

⁴⁶⁶ OPUS, Ruataniwha Water Storage Scheme – Road infrastructure and traffic assessment, May 2013, Ruataniwha Water Storage Scheme application documents, Folder 7, Tab 1, page 13, figure 2.

[869] HBRIC has accepted the importance of monitoring older sections of the seal on both state highways and local authority roads. Throughout the construction period regular maintenance will be required to ensure the roads continue to meet the level of service set by the controlling road authority. A detailed roading plan has been prepared by HBRIC.

[870] On behalf of HBRIC Richard Landon-Lane provided a brief of evidence in relation to traffic issues. Two submissions were received on this subject. The Craig Preston Trust submitted that “local roads and bridges should be upgraded to cope with increased traffic”.⁴⁶⁷ Mr Landon-Lane confirmed that these matters had already been addressed and that there would be monitoring and where necessary upgrading would be undertaken.⁴⁶⁸ Stephen Wilson⁴⁶⁹ of Parks Peak Station raised the issue of sealing the end of Wakarara Road due to the increase in vehicles. Mr Landon-Lane agreed that this should be included as an additional condition.⁴⁷⁰

[871] We are satisfied that roading and traffic considerations have been properly considered and are adequately covered by conditions.

Noise

[872] Inevitably the presence of large machinery on the construction site will produce noise over the period of construction which is estimated to be around 4 and a half years. Noise effects arising from both the construction and operation of the RWSS were considered in a report prepared by Marshall Day⁴⁷¹ and mitigation measures have been included in the Construction Environmental Management Plan (CEMP).

⁴⁶⁷ Submission 295 on Tukituki Catchment Proposal.

⁴⁶⁸ OPUS, Ruataniwha Water Storage Scheme – Road infrastructure and traffic assessment, May 2013, Ruataniwha Water Storage Scheme application documents, Folder 7, Tab 1, Sections 1.4.1, 1.4.2, 7.1 and 7.2.

⁴⁶⁹ Submission 361 on Tukituki Catchment Proposal.

⁴⁷⁰ R Landon-Lane, Evidence in Chief, paragraphs 3.6–3.7.

⁴⁷¹ Marshall Day Acoustics, Ruataniwha Water Storage Scheme – Noise effects assessment, May 2013, Ruataniwha Water Storage Scheme application documents, Folder 7, Tab 2, page 4.

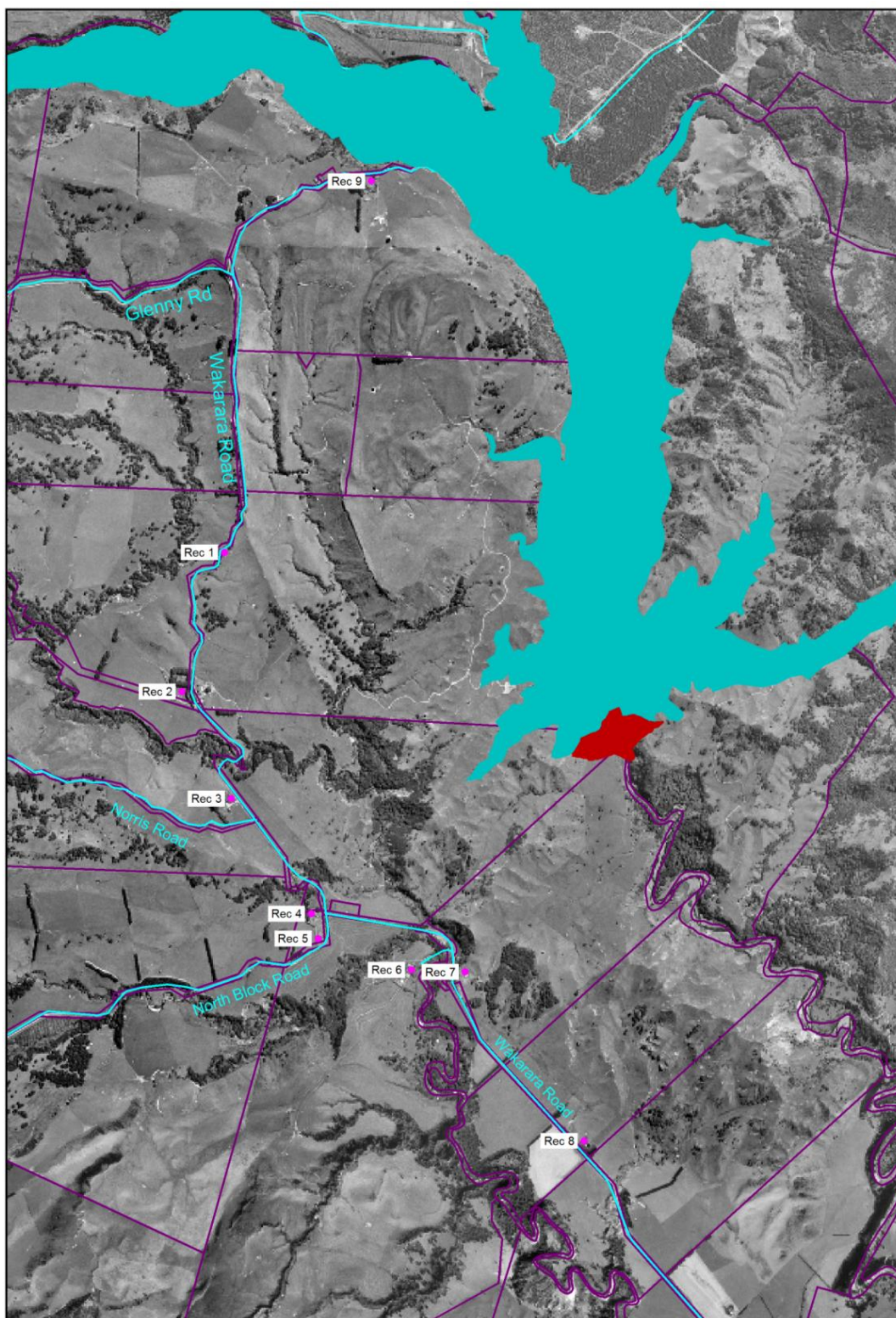


Figure 18: Dwellings in Vicinity of the Dam Site⁴⁷²

⁴⁷² Marshall Day Acoustics, Ruataniwha Water Storage Scheme – Noise effects assessment, May 2013, Ruataniwha Water Storage Scheme application documents, Folder 7, Tab 2, page 9, figure 2.

Dwelling	Owner	Comments
Rec1	JL Worsnop	Rangimarie Farm House
Rec2	JL Worsnop	Rangimarie Farm House
Rec3	RB Chrystall Trust	
Rec4	Dept of Conservation	
Rec5	Camp Wakarara	Camp Building
Rec6	RB Chrystall Trust	
Rec7	BC Preston	
Rec8	BC Preston	
Rec9	Wilson	Parks Peak Station

Figure 19: Owners of Dwellings in Vicinity of Dam Site⁴⁷³

[873] Miklan Halstead of Marshall Day provided a brief of evidence in which he summarised the outcome of the Marshall Day assessment:⁴⁷⁴

“Construction noise levels are predicted to comply with day-time construction noise limits in NZS6803:1999 at all dwellings, and night-time construction limits at most dwellings.

The noise effects at all dwellings are considered to be reasonable provided that adequate consideration of night-time noise mitigation at near [sic] dwellings Rec 6, 7 and 9 is taken into account during certain specific periods of construction. This may require limiting activities at night-time, or providing some other means of mitigation to the residents of those dwellings.

The noise levels in the working rural environment are considered to be reasonable, and are not predicted to have adverse effects.

The noise level and character of the ongoing operation of the water storage scheme are consistent with the expectations of rural land near a water course, and no adverse noise effects are predicted.

Noise effects from the Beach Nourishment Scheme are predicted to be minor or less than minor, except along the residential portion of Haumoana and Domain Roads where noise effects from truck traffic may be significant for a (likely) one-week period each year. We would consider this noise effect reasonable given its short duration, and relative to noise levels provided for in NZS6803:1999.”

Mr Halstead also accepted that the CEMP that is to be implemented by the applicant will ensure that construction activities were carried out in a manner that avoids

⁴⁷³ Marshall Day Acoustics, Ruataniwha Water Storage Scheme – Noise effects assessment, May 2013, Ruataniwha Water Storage Scheme application documents, Folder 7, Tab 2, page 8, table 1.

⁴⁷⁴ M Halstead, Evidence in Chief, page 5.

unreasonable noise emissions and that necessary mitigation will occur in relation to the three dwellings that had been identified.

[874] A submission was received from Craig Preston Trust regarding the issue of noise during construction, although no specific remedies or conditions were suggested.⁴⁷⁵ Mr Halstead noted that during the day construction noise levels at the Preston dwelling would be below a level that is reasonable for daylight hours, but that it could exceed reasonable levels during night-time and Sunday hours.⁴⁷⁶

[875] In this respect Mr Halstead drew specific attention to Condition 17 of Schedule 1 which requires all construction activity to comply with construction noise standards. In addition he noted that clauses 3.6 and 4.3 of the CEMP provide further controls as to noise and the hours of operation.⁴⁷⁷ The Board accepts that these provisions will enable the effects on the Preston dwelling to be properly managed.

[876] Effects on the Craig Preston Trust farm (that is the rural land beyond the dwelling area) were also considered in the Marshall Day report⁴⁷⁸ and in Mr Halstead's brief of evidence.⁴⁷⁹ The conclusion is that although RWSS construction will result in a temporary change to the noise level and character on the farm, it is not appropriate to impose controls on noise in rural working land and the Central Hawke's Bay District Plan does not suggest that any such controls should exist.

[877] The Board accepts that issues of construction noise is appropriately addressed in the CEMP which is to be implemented before construction begins. There is nothing before the Board that suggests noise effects arising from the operation of the RWSS are likely to be an issue.

⁴⁷⁵ Submission 295 on Tukituki Catchment Proposal.

⁴⁷⁶ Marshall Day Acoustics, Ruataniwha Water Storage Scheme – Noise effects assessment, May 2013, Ruataniwha Water Storage Scheme application documents, Folder 7, Tab 2, section 4, Page 13.

⁴⁷⁷ Schedule 6 draft Construction Environmental Management Plan of RWSS consent conditions dated 20 January 2014.

⁴⁷⁸ Marshall Day Acoustics, Ruataniwha Water Storage Scheme – Noise effects assessment, May 2013, Ruataniwha Water Storage Scheme application documents, Folder 7, Tab 2.

⁴⁷⁹ Ruataniwha Water Storage Scheme, Noise Effects Assessment, section 4.3, Page 31.

Dust

[878] The issue of dust needs to be considered in two contexts: first, during the course of constructing the dam and its associated infrastructure; secondly, as a result of the ‘bare’ zone around the lake when it is not full.

[879] As to dust during construction Tonkin & Taylor note in their Project Description report (May 2013) to HBRIC that the footprint of the construction works will cover several hectares and involve extensive stripping and carting of alluvial materials. Quarrying could also involve blasting.⁴⁸⁰ All of these activities have the potential to produce large quantities of dust which might present a particular problem during windy conditions.

[880] Measures in the CEMP to mitigate the effects of dust include:

- the use of ‘dust carts’ or sprinklers;
- stabilising surfaces;
- sealing roads;
- grassing of fill disposal or borrow areas.

Table 4 of the draft CEMP also records that where significant nuisance occurs work might need to stop until conditions improve.

[881] In any large project involving earthworks dust is potentially capable of having an adverse effect on the environment. When assessing that potential effect the Board needs to keep in mind that construction will be taking place in a working rural environment where dust arising from soil disturbance is not particularly unusual. Viewed in that light we are satisfied that the potential adverse effect arising from dust generated during the construction phase will be appropriately mitigated by the CEMP.

⁴⁸⁰ Tonkin & Taylor, Ruataniwha Water Storage Scheme – project description, May 2013, Ruataniwha Water Storage Scheme application documents, Key Reference Report, Folder 3, Tab 1, paragraph 4.7.5.

[882] Now we turn to potential dust effects arising from the operation of the RWSS. This was of particular concern of Sara Gerard (Gerard Land Design), a Landscape Architect, who lodged a submission and gave evidence.⁴⁸¹ Her concerns were directed to the 'bare zone' surrounding the lake when it was not full and the delta at the head of the lake.

[883] While Dr Fisher (for HBRIC) accepted that there is potential for dust generation when the reservoir is drawn down, he did not consider that this would be a significant effect, especially given the relative remoteness of the dam site.⁴⁸² He also noted that any dust generation could be monitored by tracking any complaints and if there was an issue for dwellings near the construction, shelter belts could be considered.⁴⁸³

[884] Dr Fisher also informed the Board that finer sediments would be worked into the deeper part of the lake by the waves with the result that coarser material would be left along the shores. This means that much of the fine sediment is likely to be deposited on the inflow delta. In Dr Fisher's opinion wind speeds of around 60km/hour would be required to raise dust from alluvial fans and dry lake beds. He said that such winds are rare for that location during January to May when lake levels would be drawn down.⁴⁸⁴

[885] When considering the potential for dust nuisance it is also important to keep the matter in perspective by taking into account the periods during which the lake is likely to be at particular levels. Those levels have already been established by Mr Leong. For 90% of the time the lake will be no more than 23.5m (vertically) below its full level of RL 469.5m.

[886] Taking all matters into account the Board is satisfied that any problem arising from windborne dust is likely to be less than minor. While the operation of the RWSS might give rise to a minor increase in dust that is generated compared with the current situation, the Board notes the site is quite remote and the effects will be limited.⁴⁸⁵ We

⁴⁸¹ Submission #317.

⁴⁸² T Fisher, Evidence in Chief, paragraph 7.6.

⁴⁸³ T Fisher, Evidence in Chief, paragraph 9.3.

⁴⁸⁴ T Fisher, Rebuttal Evidence, paragraph 4.7, page 4.

⁴⁸⁵ The effects of dust during construction will be considered separately.

also take into account that there is to be an operational Sediment Management Plan which would require remedial work if dust became an issue.

[887] Within a construction site the possibility of contamination due to oil spillage or other contaminants is always a risk. Such contaminants can enter both soil and water. HBRIC has identified this as a concern and has addressed it through conditions⁴⁸⁶.

Soil contamination

[888] A site investigation as to the possibility of ground contamination was undertaken by Tonkin & Taylor Limited. In particular this firm investigated whether any activities on the Hazardous Activities and Industries List (HAIL) had taken place at a historic sawmill site which is likely to be used for a screening plant during construction of the dam.⁴⁸⁷

[889] If an activity or industry on the HAIL has been undertaken on a site the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 might apply. The HAIL merely indicates that such activities have a greater probability of site contamination, not that hazardous substances are certainly present.

[890] Although Tonkin & Taylor found that HAIL activities had taken place on the old sawmill site, there was uncertainty about the layout of the site and the location of any fuel storage areas. The Tonkin & Taylor report concluded that the likelihood of significant contamination was very low and that provided there was no excavation within the former sawmill footprint there was no need to explore the issue any further.

[891] It is contemplated that if any contamination issues emerge at the old mill site (or elsewhere) such issues can be addressed through the CEMP. In the event that contamination is encountered during the construction of the water distribution network,

⁴⁸⁶ Schedule 2 General conditions condition 13(g).

⁴⁸⁷ Tonkin & Taylor Limited, Preliminary Site Investigation for Ground Contamination Ruataniwha Water Storage Scheme, 3083 Wakarara Rd Tikokino, March 2013, Appendix E, of Environmental Management Services Limited Ruataniwha Water Storage Scheme - Planning Assessment, May 2013, Ruataniwha Water Storage Scheme application documents, Folder 5, Tab 1.

appropriate remediation options might include removal of contaminated material and/or lining the headrace canal to ensure there is no risk to human health.⁴⁸⁸

[892] Judging from the reports that have been provided the prospect of encountering contamination is low. Even if issues of that nature emerge the CEMP makes adequate provision for mitigation. When reaching those conclusions we have taken into account the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011.

Network utilities

[893] As already mentioned a 6.5MW power station and accompanying network are included in the scheme for which consent is sought. The transmission of electricity via a 33kV line is a permitted activity under the CHBDC Operative Plan. Mr Leong reported that an operating buffer of 0.20m above the full storage level for irrigation would allow about 24 hours of full generation through the main turbine.⁴⁸⁹

[894] Agreements have been reached between HBRIC and Transpower NZ Limited in relation to the national grid. The hydropower station and utility network were not questioned by submitters and the Board accepts that the adverse effects (if any) of the power generation would be minor.

[895] The National Policy Statement for Renewable Energy Generation 2011 has the objective of recognising the national significance of renewable energy generation. The proposed generation of hydroelectricity will give effect to the Policy Statement.

[896] The National Policy Statement on Electricity Transmission 2008 is only relevant if the RWSS might cause adverse effects to the national grid owned and operated by Transpower. The agreement having been reached with Transpower indicates that this will not be the case.

⁴⁸⁸ Draft Construction Environmental Management Plan (CEMP), May 2013, paragraph 3.7.

⁴⁸⁹ D Leong, Evidence in Chief, paragraph 9.7.

Terrestrial Ecology

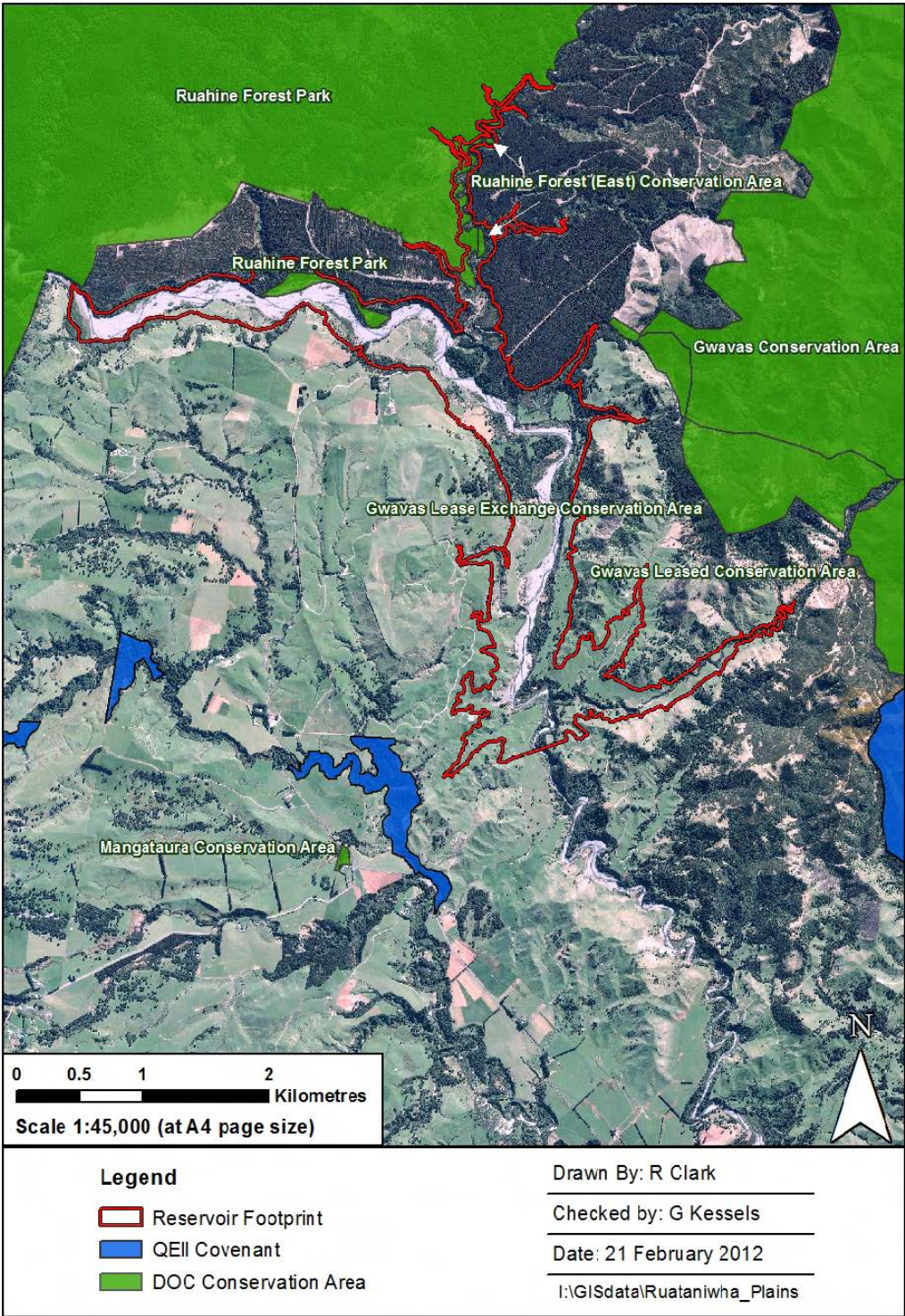


Figure 20: Map showing Reservoir Footprint, QEII Covenant and DOC Conservation Area⁴⁹⁰

⁴⁹⁰ Kessels & Associates Limited, Ruataniwha Water Storage Scheme – Terrestrial Ecology Study assessment of ecological effects final – Volume 1, May 2103, Ruataniwha Water Storage Scheme application documents, Folder 6, Tab 1, page 12, Figure 2.

[897] A number of submitters and expert witnesses raised strong concerns about the impact of the dam and reservoir on terrestrial ecology. In response the applicant submitted that the impacts and potential effects on terrestrial ecology had been adequately assessed and are satisfactorily addressed through the mitigation and offsetting measures before the Board.

Report on terrestrial ecology

[898] Accompanying the application for resource consents was a report prepared by Gerald Kessels and others which was reviewed by Dr John Craig, Associate Professor Stuart Parsons, and Dr Vaughan Keesing.⁴⁹¹ This report listed the potential ecological effects of the construction and operation of the RWSS on terrestrial indigenous fauna and flora:⁴⁹²

“A permanent loss of a variety of indigenous vegetation communities and braided river within the reservoir, dam and spillway footprint area;

A permanent loss of a variety of feeding, roosting and breeding habitats (both exotic and indigenous) for birds, lizards, bats and invertebrates;

Alteration of habitats for indigenous flora and fauna within and adjacent to braided river ecosystems downstream of the dam and upstream water intake structure associated with changes in sediment deposition rates, river flow patterns and changes in land use; and

A change of habitat types on the margins of the reservoir due to changes in hydrology and effects of seasonal and irrigation drawdown causing inundation and ebbing of the ‘lake’ edge; and

Disturbance of remaining indigenous flora and fauna adjacent to the reservoir due to potential increases in the recreational use of the reservoir and its margin.”

It was also recorded in the report that the total area affected by the dam, reservoir, and spoil disposal would be approximately 450.18ha.

[899] A total of 185.18ha of ecologically significant indigenous vegetation and habitats would be flooded by the proposed reservoir (or covered over by associated

⁴⁹¹ Kessels & Associates Limited, Ruataniwha Water Storage Scheme – Terrestrial Ecology Study assessment of ecological effects final – Volume 1, May 2103, Ruataniwha Water Storage Scheme application documents, Folder 6, Tab 1.

⁴⁹² Kessels & Associates Limited, Ruataniwha Water Storage Scheme – Terrestrial Ecology Study assessment of ecological effects final – Volume 1, May 2103, Ruataniwha Water Storage Scheme application documents, Folder 6, Tab 1, page 1.

infrastructure, including the dam structure, new access tracks and spoil disposal sites). This comprises: 80.71ha of mature and secondary indigenous forest (including a number of trees which would be in excess of 300 years old); 2.69ha of treelands; 22.70ha of secondary indigenous scrub; 73.97ha of gravel river bed; and 5.11ha of wetland or seep zones. One ‘at risk’ plant species was found — the red mistletoe.⁴⁹³

[900] During field surveys by Kessels and Associates in the vicinity of the reservoir a total of 38 bird species (11 endemic) were identified. Of all individual birds formally observed, 55% were native and 45% introduced. Threatened or at risk species made up 2.5% of all observations (23 birds). These included a pair of nesting New Zealand bush falcon, and an adult banded dotterel with a chick. Nationally ‘at risk’ species on site were pied stilt, New Zealand pipit, black shag and North Island fernbird. Tui was the most common of the threatened species that were observed.

[901] Surveys by Kessels & Associates for long-tailed bats suggested that there was a population throughout the proposed reservoir footprint. Eleven lizard species are known to exist in the southern Hawke’s Bay region or neighbouring areas of the southern North Island. However, only one lizard was found during the field survey (a southern North Island forest gecko which is not classified as nationally at risk or threatened).

[902] Targeted rapid surveys for terrestrial invertebrates were undertaken by Kessels & Associates. Results showed a rich diversity of insects and land snails. Two individual ‘at risk’ Hawke’s Bay tree wetas (*Hemideina trewicki*) were also discovered within the study area.

[903] Walk-through surveys of waders and water birds were completed along a 4.5 reach of the Waipawa River about 19km downstream of the dam site. Nationally

⁴⁹³ Kessels and Associates Limited, Ruataniwha Water Storage Scheme – Terrestrial Ecology Study assessment of ecological effects final – Volume 1, May 2103, Ruataniwha Water Storage Scheme application documents, Folder 6, Tab 1, page 2.

‘vulnerable’ banded dotterel were commonly sighted and nationally ‘at risk’ pied stilt and pipit were also recorded.⁴⁹⁴

[904] The Kessels’ report concluded that a number of measures were required to avoid or remedy potential adverse effects on terrestrial ecology. These included a bat management plan, a pre-construction lizard survey and translocation plan, weed hygiene and surveillance, a Blue Duck survey of Dutch Creek and post construction monitoring.⁴⁹⁵

[905] In addition three mitigation and offset packages were recommended.⁴⁹⁶ It was reported that those programmes would result in a number of significant benefits including intensive targeted animal pest control over 1100ha of habitats within the Makaroro River Catchment, 146ha of habitat recreation and enhancement around the new reservoir, assisting landowners to protect and manage 622ha of bush, scrub and wetland and approximately 340ha of braided river habitats for wading birds. In addition Project E would recreate and restore wetlands in and along the old Waipawa River/Papanui Stream⁴⁹⁷

Challenges to the adequacy of the surveys and report

[906] For the applicant Mr Kessels provided evidence supporting his report and the recommendations as to mitigation and offsetting contained in the Integrated Mitigation and Offsetting Approach (IMO). Dr Craig provided supporting evidence in relation to birds and pest control. Dr Parsons provided supporting evidence about bats and Dr Keesing made particular reference to botanical aspects.

⁴⁹⁴ Kessels and Associates Limited, Ruataniwha Water Storage Scheme – Terrestrial Ecology Study assessment of ecological effects final – Volume 1, May 2103, Ruataniwha Water Storage Scheme application documents, Folder 6, Tab 1, page 110.

⁴⁹⁵ Kessels and Associates Limited, Ruataniwha Water Storage Scheme – Terrestrial Ecology Study assessment of ecological effects final – Volume 1, May 2103, Ruataniwha Water Storage Scheme application documents, Folder 6, Tab 1, page 111.

⁴⁹⁶ Ruataniwha Reservoir Restoration Buffer and Catchment Enhancement Zone – Ruataniwha Riparian Enhancement Zone (River Halo Project); and Ruataniwha Threatened Species Habitat Enhancement.

⁴⁹⁷ Kessels and Associates Limited, Ruataniwha Water Storage Scheme – Terrestrial Ecology Study assessment of ecological effects final – Volume 1, May 2103, Ruataniwha Water Storage Scheme application documents, Folder 6, Tab 1, page 112.

[907] Dr Lloyd⁴⁹⁸ and Marie Brown (representing EDS), were the principal experts in support of submissions opposing the RWSS. Dr Lloyd is a very experienced ecologist and botanist and Ms Brown has submitted a thesis for her PhD on the subject of reviewing the implementation of ecological compensation under the RMA.

[908] In his evidence Dr Lloyd was highly critical of the assessments that had been undertaken. He told the Board:

“The applicant’s terrestrial ecological assessment of indigenous vegetation, plant species, lizards, river birds and invertebrates is deficient and understates the importance of and adverse effects ...indigenous vegetation and .. fauna.”

He considered that there had been a “glaring omission” to adequately address the significance of the braided river birds, the presence of short-tailed bats could not be ruled out, other species of lizards were likely to be present, and there were deficiencies in the identification of plant species.

[909] Concerns were also expressed by Dr Lloyd about the reliance of mitigation measures on land owner consent. He said that if the project is consented and adverse effects on the environment cannot be avoided stringent conditions should be imposed for the protection and enhancement of the braided river populations.

[910] Dr Craig disagreed.⁴⁹⁹ He did not consider there was any “major” deficiency in the ecological assessment. His view was that predators were the major threat to bird life and that the IMOA package was more likely to assist the banded dotterel populations than the status quo. Dr Keesing acknowledged the botanical omissions identified by Dr Lloyd but concluded that within the overall context of the study they were not significant.⁵⁰⁰

[911] Challenges to the report also focussed on the issue of bats. Dr Lloyd stated:⁵⁰¹

“Long-tailed bats were largely recorded foraging throughout the sheltered valley floor. Bat activity patterns suggest that bats are likely to be roosting in the

⁴⁹⁸ K Lloyd, Tukituki Catchment Proposal Hearing Transcript, page 1682.

⁴⁹⁹ J Craig, Rebuttal Evidence, pages 3 – 9.

⁵⁰⁰ V Keesing, Rebuttal Evidence, paragraphs 12 and 13.

⁵⁰¹ K Lloyd, Evidence in Chief, paragraphs 68 and 69.

proposed reservoir area.....Indigenous habitats in the area are likely to be providing high quality habitat for long-tailed bats, as they contain large, cavity-bearing indigenous trees that provide the highest-quality roost sites.”

He did not share Mr Kessels confidence that bats that had been displaced would be able to find new roosts. He also considered that the felling of trees had the potential to injure or kill bats.⁵⁰²

[912] In response to a question from the Board Mr Kessels said that his greatest concern as a specialist ecologist was about the bats.⁵⁰³ However, it was his belief that they would be able to move to alternative roosts as the reservoir began to fill and it was possible to create roosting sites by planting and using artificial roosting boxes. He noted that these boxes had been used in South Canterbury and Hamilton. Mr Kessels also considered that inspections immediately before tree felling would avoid loss of bats in that way.

[913] Dr Parsons⁵⁰⁴ noted that despite clear-felling of logs, bats have been recorded in the vicinity of the Kinleith Forest for the past 30 years. He also shared the view that the loss of some roosts during the filling of the reservoir was unlikely to put the population at risk. Dr Parsons also considered that artificial roosting boxes (and pest control) would serve to offset remaining short to medium term negative effects⁵⁰⁵

[914] Giving evidence for EDS, Ms Brown stated:⁵⁰⁶

“If the Board decides to approve the RWSS then, in light of acknowledged information deficiencies, the consent holder should be required to undertake additional surveys to more accurately describe the site and its ecology prior to commencement of construction.”

Ms Brown said that her chief concern was the lack of detail provided by the applicant in the IMO. While some of her concerns had been addressed by the revised version that

⁵⁰² K Lloyd, Evidence in Chief, paragraphs 138 and 140.

⁵⁰³ G Kessels, Tukituki Catchment Proposal Hearing Transcript, page 656.

⁵⁰⁴ S Parsons, Rebuttal Evidence, paragraph 18.

⁵⁰⁵ S Parsons, Rebuttal Evidence, paragraph 23.

⁵⁰⁶ M Brown, Tukituki Catchment Proposal Hearing Transcript, page 1991.

was now before the Board, there was still a lack of certainty as to the manner in which the IMOA would be implemented.⁵⁰⁷

The Board's findings

[915] Clearly the RWSS will have significant adverse ecological effects on terrestrial fauna and flora. Furthermore, the Board needs to recognise and provide for the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna as a matter of national importance under s6(c) of the RMA.

[916] While there is a conflict between the experts about the adequacy or otherwise of the terrestrial ecological assessment, Dr Lloyd accepted that the bird survey was “reasonably robust”.⁵⁰⁸ The exception was the downstream braided river environment of the wading birds. When considering that issue the Board takes into account that the environment below the confluence of the Makaroro and Waipawa Rivers would not be significantly affected by the dam. There is also evidence that the RWSS might in fact, improve that environment. Having reflected on these the Board has reached the conclusion that Dr Craig is right when he states the adverse effects on wading birds have been overstated.

[917] On the issue of bats we found the evidence of Dr Parsons persuasive. He has expertise in this field. The Board also notes the experts agreed at expert conferencing that while the proposed dam site is significant for *long-tail bats*, it is unlikely that *short-tail bats* are present.⁵⁰⁹ Moreover, the evidence indicates that any adverse effects on long-tail bats can be appropriately managed.

[918] Although the Board accepts that deficiencies in the studies that were undertaken have been exposed, these need to be kept in perspective. Obviously the Board cannot rule out the possibility that threatened plant, lizard or invertebrate species which have not been identified to date are present at the site. But that does not suggest to the Board that the studies already undertaken are worthless. Rather it indicates that adaptive

⁵⁰⁷ M Brown, Tukituki Catchment Proposal Hearing Transcript, page 1992.

⁵⁰⁸ K Lloyd, Evidence in Chief, paragraph 28.

⁵⁰⁹ Expert Conferencing Joint Witness Statement to the Board of Inquiry – Terrestrial ecology, 17 October 2013.

management may be necessary to address any further information that becomes available. In this respect we note that all of the experts present at conferencing agreed that “adaptive management is suitable to address unforeseen issues”.⁵¹⁰

[919] Ultimately the critical issue is whether the adverse environmental effects which undoubtedly exist can be adequately avoided, remedied or mitigated. The issue of mitigation and offsetting in the context of the IMO package will be addressed in detail later in this report.⁵¹¹

Aquatic ecology

[920] There was a widespread feeling on the part of many submitters that one of the most serious threats to aquatic ecology was the risk of nutrient discharge into water bodies as a result of land use intensification. That effect has already been assessed separately with reference to water quality. It only remains for the Board to assess any other actual or potential effects on aquatic ecology (and associated values) that might arise from the construction and operation of the RWSS.

Effects requiring consideration

[921] The effects that need to be considered are conveniently listed in the Cawthron Report prepared by Dr Young and others in 2013:⁵¹²

- “Disturbance of the riverbed during construction and associated mobilisation of sediment that could influence water clarity and have effects on periphyton, invertebrates and fish (both native and introduced species)
- effects of changes in bed geomorphology downstream of the dam on periphyton, invertebrates and fish;
- effects on water quality associated with water storage within the proposed reservoir Blockage/interruption of upstream and downstream fish passage by the dam;
- permanent loss of riverine habitat resulting from inundation by the proposed reservoir;

⁵¹⁰ Expert Conferencing Joint Witness Statement to the Board of Inquiry – Terrestrial ecology, 17 October 2013.

⁵¹¹ At paragraph [1087] – [1111].

⁵¹² Cawthron Institute, Ruataniwha Water Storage Scheme - aquatic ecology assessment of effects, May 2013, Ruataniwha Water Storage Scheme application documents, Folder 5, Tab 3, page iii.

- reductions in the quantity and quality of spawning habitat for rainbow trout;
- changes to angling opportunities;
- changes in water quality associated with changes in the flow regime downstream of the dam;
- changes in periphyton abundance and distribution as a result of changes in the flow regime;
- effects of changes in the flow regime downstream of the dam (including short-term fluctuating flows associated with changes in irrigation demand and hydro-peaking) on habitat availability for invertebrates and fish;
- effects of flow changes on fish stranding;
- diversion of fish into the water distribution network at the irrigation intake;
- instream and riparian habitat disturbance associated with changes in land use on the Ruataniwha Plains associated with the Scheme;
- changes in water quality and effects on periphyton, invertebrates and fish associated with changes in land use.”

Evidence for the applicant

[922] Dr Young, Dr Ausseil and Dr Fisher provided the primary evidence for the applicant on these matters. In broad terms they contend that while there will be adverse effects on the aquatic ecology, these effects have been adequately mitigated by the mitigation and offset measures incorporated in the proposed conditions for the RWSS.

[923] The mitigation and offset measures proposed by the applicant include :⁵¹³

- *Ruataniwha Reservoir Restoration Buffer and Catchment Enhancement Zone*: this includes measures to protect and enhance the aquatic habitat within the upper Makaroro River above the dam and other reservoir tributaries such as Dutch Creek;

⁵¹³ Hawke’s Bay Regional Investment Company Ltd, Ruataniwha Water Storage Scheme – Part C Assessment of Environmental Effects, May 2013, Ruataniwha Water Storage Scheme application documents, Folder 2, Tab 1, page 127.

- *Ruataniwha Riparian Enhancement Zone (River Halo Project)*: which includes the protection of riparian habitats alongside the Makaroro and Waipawa Rivers that are affected by flow fluctuations resulting from the RWSS;
- *Ruataniwha Threatened Species Habitat Enhancement*: which includes a native fish trap and transfer programme;
- *Ruataniwha Plains Spring-fed Stream Enhancement and Priority Sub-Catchment Phosphorus Mitigation*: this includes the protection and enhancement of spring-fed streams and other waterways that drain the lower Ruataniwha Plains (these , provide good habitat native fish species and also provide for spawning and juvenile trout rearing);
- *Restoration of Old Waipawa River Bed/Papanui Stream*: which includes rehabilitation and enhancement of water quality and stream habitat in the bed of the old Waipawa River/Papanui Stream and will involve fencing, planting and wetland creation along the riparian margins of the stream.

The opposing view

[924] Evidence and representations in opposition came from numerous people including Ms McArthur, Dr Morgan, Mr Maurice Black (representing NKII), Ms Baker, Dr Death, Dr Mike Joy (representing Forest and Bird, Hawke's Bay Environmental Water Group (HBEWG) and NKII, and Eugenie Sage MP.

[925] Not surprisingly all witnesses raised the issue of fish passage, and many questioned the effectiveness of the proposed trap and transfer system. Other concerns included the effects of construction on aquatic ecology, interruption to the natural flow of the Makaroro River, fish screening at the upper irrigation intake, effects from land use changes on downstream water quality, and the effectiveness of proposed flushing flows.

[926] Many of the concerns expressed by Ms McArthur reflected matters that were worrying other parties involved in the inquiry. She reminded the Board that the Makaroro River sub-catchment has some of the best water quality and ecological health

of any waterway in the Tukituki catchment. She is concerned about the effects of the construction of the dam on aquatic macro-invertebrates and fish in the vicinity of the dam site and downstream.

[927] The barrier to the migration of native fish created by the dam is a major concern. Ms McArthur anticipates that this will cause local fish populations to decline. She also believes that the reservoir will not provide a positive environment for native fish which will be deprived of their upstream riverine environment. Interference with natural river flows will have an adverse effect on aquatic life and reduce the availability of quality habitat. There will also be a cumulative, immediate and long term impact on the spawning and recruitment of trout in the Makaroro and Waipawa catchments.

[928] Concerns expressed by Dr Joy included the removal or reduction of riverine habitat for riverine specialist species including eels; movement of trout into previously uninhabited areas; creation of suitable habitat for pest fish; increasing transit time for fish larvae to travel downstream, thereby increasing their chances of starvation or predation; potential death of a significant percentage of downstream migrating larvae when going through or over the dam; and the potential for death of downstream migrating eels.

The Board's findings

[929] We begin by considering the effects arising from the construction of the dam. Those effects will be most significant close to the dam site and the effects downstream of the Waipawa and Tukituki confluences would be much less significant.⁵¹⁴ Clearly the diversion of the river during construction will disturb aquatic invertebrates and fish, as well as affecting spawning. However, once the working site has been stabilised it is predicted that any effect on water quality will rapidly reduce (although it might take 6-12 months before there is full recovery from mobilised sediment in the water).

⁵¹⁴ Cawthron Institute, Ruataniwha Water Storage Scheme - aquatic ecology assessment of effects, May 2013, Ruataniwha Water Storage Scheme application documents, Folder 5, Tab 3, page iv.

[930] These matters were recorded in the Cawthron Institute Report and accepted by all the experts at conferencing.⁵¹⁵ It was also agreed that the combination of the CEMP and proposed consent conditions (including monitoring) would be an adequate way of minimising the effects of construction on the river ecology.⁵¹⁶ The Board accepts that the adverse effects of the dam construction can be mitigated to an acceptable degree.

[931] Long-term effects following completion of the dam are of much greater concern, especially two particular effects: first, the permanent loss of fish passage; secondly, the permanent loss of the riverine environment for up to 7km above the dam (depending on how much water is in the reservoir at any particular time).

[932] Currently there are at least seven migratory native fish species in the vicinity of the dam. All the experts agreed that without any mitigation the dam will block upstream movement of all fish and reduce downstream movement. They also agreed that although the proposed trap and transfer of fish would be the best available mitigation option, there were concerns about its efficacy.⁵¹⁷ Dr Joy thought that the trap and transfer method might only produce a 50% efficiency in successfully getting fish past the dam (either up or down).⁵¹⁸ Dr Young rated the prospects of maintaining the full range of native fish species currently found upstream of the dam as low to medium.⁵¹⁹

[933] All of this indicates to the Board that the blocking of fish passage by the dam is a serious adverse effect which could not be mitigated by the trap and transfer proposal. The Board also keeps in mind Dr Joy's evidence that 68% of New Zealand's native fish are currently listed as threatened, and loss of habitat and water quality impacts are a major cause of their heightened threat status.⁵²⁰ By the same token there is no suggestion that the dam would restrict access of fish species to other parts of the catchment.

⁵¹⁵ Expert Conferencing Joint Witness Statement to the Board of Inquiry – Terrestrial ecology, 17 October 2013, paragraph 1.

⁵¹⁶ Expert Conferencing Joint Witness Statement to the Board of Inquiry – Terrestrial ecology, 17 October 2013, paragraph 2.

⁵¹⁷ Expert Conferencing Joint Witness Statement to the Board of Inquiry – Terrestrial ecology, 17 October 2013, paragraph 3-6.

⁵¹⁸ M Joy, Evidence in Chief, paragraph 16.

⁵¹⁹ R Young, Rebuttal Evidence, paragraph 4.1.

⁵²⁰ M Joy, Evidence in Chief, paragraph 15.

[934] Now we turn to the effects of the reservoir. The creation of a 372ha reservoir will result in the loss of up to 7km of flowing water habitats, although the Board accepts that some of the native fish species currently found in that habitat will be able to use the newly formed reservoir. On the other hand, other species such as torrent fish, bluegill bully, redfin bully, Cran's bully, and dwarf galaxias are unlikely to survive in the reservoir and will be lost.⁵²¹

[935] According to the Cawthron Report a trout population of between 1000–2000 adult fish is likely to develop in the reservoir and support a full season fishery. Compared with the status quo, juvenile trout production from these adult trout would be enhanced and it is likely that some of these juvenile trout would successfully pass downstream and make a substantial contribution to the fishery in the Waipawa and Tukituki Rivers. This evidence was not seriously challenged and the Board accepts it.

[936] Downstream of the dam there will be other effects, some positive and others negative. The most significant alteration would be the changes in flows and the absence of sediment which have already been discussed. Overall the Board has concluded that the positive and negative effects downstream are reasonably evenly balanced and that these downstream effects can be regarded as less than minor.

[937] Additional mitigation/offset possibilities were discussed by the experts at conferencing. They considered that a management plan focusing on each species of fish that included, but was not limited to, enhancing fish habitat and enabling fish access to areas where they cannot currently access should be made part of any mitigation package. It has been established that a total of 88 structures at 82 separate locations within the Tukituki catchment prevent upstream or downstream migrations of fish. Culverts, stormwater pumping stations and weirs make up the majority of these structures. The applicant agreed to extend its mitigation and offset package by budgeting \$10,000 per annum to enhance the access of fish throughout the catchment. We will return to this matter when considering mitigation and offsetting.

⁵²¹ Cawthron Institute, Ruataniwha Water Storage Scheme - aquatic ecology assessment of effects, May 2013, Ruataniwha Water Storage Scheme application documents, Folder 5, Tab 3, page v.

[938] Obviously the main adverse effect will be the permanent loss of fish passage (except to the extent that the trap and transfer regime is successful) and the permanent loss of the riverine habitat that will be inundated. As we already observed these adverse effects cannot be mitigated. As with the effects on terrestrial ecology, the IMO package is critical to the outcome of the applications for consent and will be returning to that matter.⁵²²

Landscape and visual effects

[939] Two landscape architects presented evidence on this topic. For the applicant Gavin Lister of Isthmus and in opposition Ms Gerard, of Gerard Land Design, who is also a submitter. Mr Percy, a planner, also gave evidence for Fish and Game.

The landscape

[940] The proposed dam site is within the Makaroro Valley which lies at the foot of the Ruahine Ranges. To the north is the Wakarara Range which rises to about a 1000m above sea level. In earlier days the long valley between the Ruahine and Wakarara Ranges had been logged and much of the area has now been replanted with exotic plantation as part of the Guavas Forest. The Ruahine Ranges provide a wilderness landscape with a number of tracks and back country huts.

[941] From the bottom of the Ruahine Ranges the Makaroro River flows through higher terraces and foothills. The rolling terraces, which are intersected by streams, range from about 500m above sea level to around 250m. This land is mostly used for pastoral farming.

[942] Below the terraces and foothills are the Ruataniwha Plains which fall from around 220masl to about 150m against the hills to the east. A series of parallel rivers and streams cross the plains from west to east. They join to form the Tukituki River which then flows north alongside a range of limestone hills until it reaches the coast.

⁵²² See paragraph 1087] – [1111].

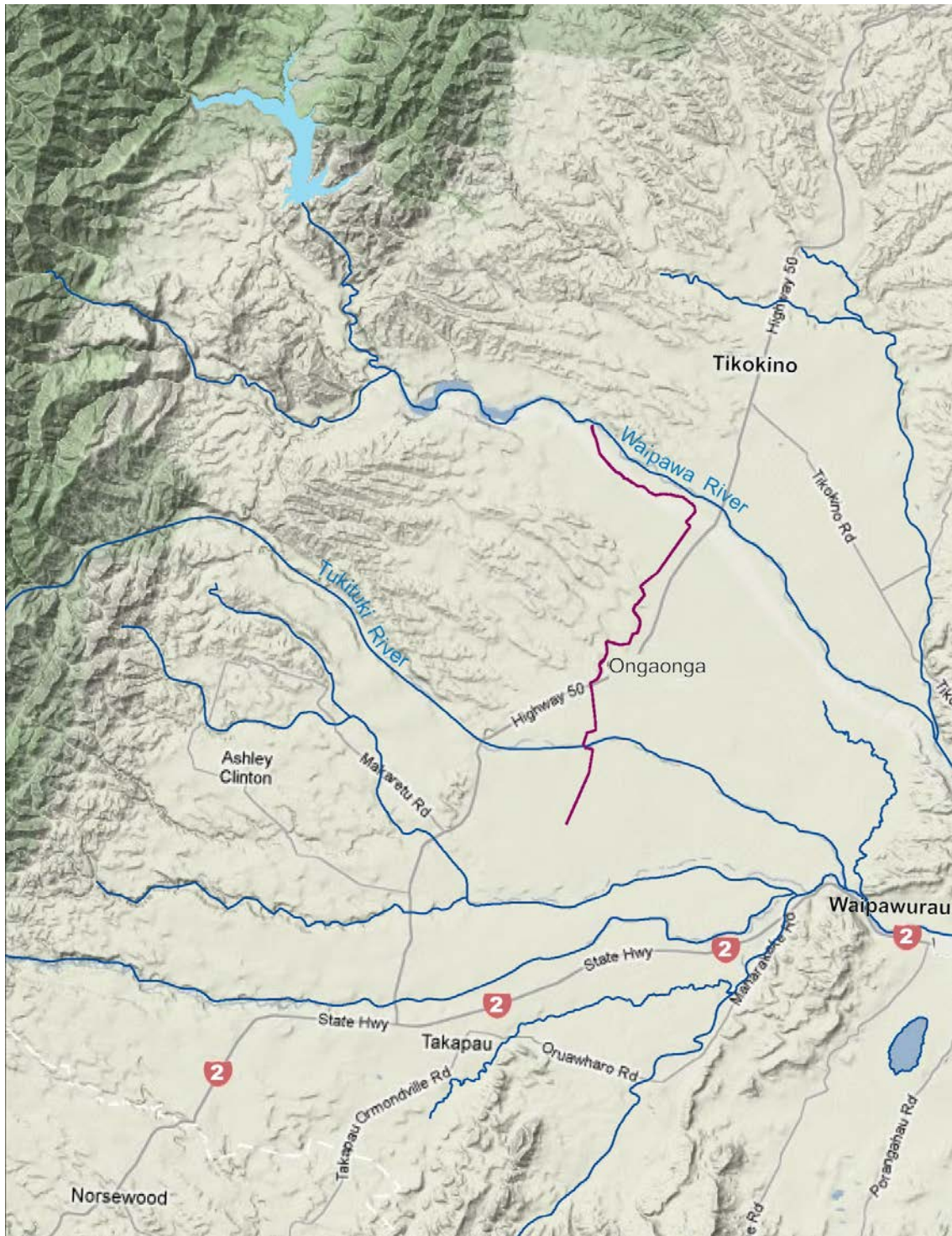


Figure 21: Landscape Context Map

[943] Over time large sheep runs on the plains have been subdivided into smaller farms with the pasture having been progressively improved. There is a geometric pattern of land use and shelter belts. The plains are drought-prone in the summer and large pivotal irrigators are a common sight. Aesthetically the plains can be described as a ‘working’ landscape. Recreational uses include river related activities.

[944] To the north-east of the Ruataniwha Plains is the Otane basin which is Zone M for the purposes of the irrigation distribution network. This basin, which forms part of the valley that links the Ruataniwha and Heretaunga Plains, is mostly used for sheep and beef farming. One of its features is the Papanui Stream which is in a generally degraded condition.

The rivers

[945] This topic was carefully reviewed by Mr Lister and Ms Gerard at conferencing, and the Board is grateful for the effort that they made to produce a comprehensive and informative report (without the assistance of a Commissioner).

[946] It is common ground that the section of the Makaroro River upstream of the proposed dam and reservoir has very high natural character. This reflects that this section of the river flows through ranges that are essentially a national wilderness.

[947] Mr Lister and Ms Gerard agree that the Makaroro has a moderately high degree of natural character at the reservoir and dam site. They see it as an unmodified river system within a river catchment of very high to moderately high landscape values.

[948] Downstream of the dam Ms Gerard considers the riverscapes of the gorge sections have high natural character while the wider landscape has moderately high natural character. On the other hand Mr Lister considers that the river has moderately high natural character but that there are places within the gorge section where the perception of natural character will be high.

[949] With reference to the Waipawa and Tukituki Rivers downstream of the dam Mr Lister considers that while there are local variations, the downstream sections of these rivers below Alderwood Farm have moderate natural character, taking into account the obvious presence of human activities and structures. Ms Gerard considers that upstream of SH50 the Waipawa River is an unmodified braided river (no gravel extraction, channelling, or stop banks) with remnants of native vegetation. Downstream of SH50 Ms Gerard agrees with Mr Lister's assessment.

[950] Both agree that the existing character of the old bed of the Waipawa River and the Papanui Stream is low. This reflects the historical diversion of the Waipawa River, surrounding land uses, and lack of vegetation.

Effects of the RWSS



Figure 22: View North from Preston Property over Site of Proposed Dam and Reservoir



Figure 23: Photo Simulation of Proposed Dam and Reservoir from the Isthmus Report

[951] Mr Lister and Ms Gerard agree that the dam and reservoir will give rise to significant adverse effects on natural character in the reservoir footprint and dam site because the reservoir will inundate and destroy the naturally braided river, terraces, gorge land forms and features, and some areas of natural vegetation. It will also affect natural river flows and processes, including sediment transport.

[952] Mr Lister considers that the proposed location of the dam is appropriate because it is on a tributary catchment and within a modified farming landscape. He considers that it avoids the high natural character area upstream and the dam site itself has low visibility. On the other hand Ms Gerard considers the location is inappropriate because it is in an unmodified braided river system and river gorge with a range of environmental values that cannot be replaced.

[953] Both Mr Lister and Ms Gerard agree that the reservoir will be a ‘working’ reservoir and will therefore not have the same amenity as a natural lake with relatively stable water levels. Its amenity will fluctuate with changes in water levels and the extent of the ‘bare’ shoreline zone. However, the reserve will have good amenity when the reservoir is full and will still have a degree of amenity at lower water levels. Its amenity will be lowest when the reservoir is at its minimum level in late summer or autumn and in dry years. They note that the margins of the reservoir are likely to appear ‘raw’ when it is first filled because of erosion processes, but that over time it may acquire more naturalistic shoreline features.

[954] Mr Lister and Ms Gerard agree that it is desirable to remove all standing trees within the reservoir footprint for visual, safety, and recreational and water quality reasons. They suggest that the IMO A should be firm about the removal of *all* trees within the footprint of the reservoir. They also comment that erosion might compromise buffer planting and that conditions should be framed to ensure that the planting is replaced if that happens.

[955] As to the distribution network, Mr Lister and Ms Gerard agree that the location of the upstream intake is acceptable in natural character and landscape terms. They also agree that canals can be positive features in the landscape, although there will be a degree of ‘cut and fill’. The canal will be most visible where it is crossed by the highway at Ongaonga. On other roads there will only be glimpses.

[956] With reference to changes in the character of the landscape it was agreed that the landscape can, in a general sense, accommodate the changes in land use such as overhead irrigators, reconfiguration of paddocks, and some clearance of shelterbelts. While Ms Gerard agreed that these changes are likely to occur, she believes that the greatest impact will be the change in scale and removal of trees. Both landscape architects agree that guidelines should be developed to promote landscape values in conjunction with irrigation and changes of land use.

[957] On the basis of other evidence Mr Lister and Ms Gerard acknowledged that there will be changes to the flow regime, sediment load, river morphology, vegetation, and potentially changes to river ecology. For her part Ms Gerard considers that these will adversely affect the intrinsic values of the river.

[958] Finally, there is agreement that the type and mix of mitigation measures are appropriate. However, Ms Gerard is concerned about whether the mitigation measures will be implemented and she is also concerned about the situation that will arise at the end of the life of the dam when it is decommissioned.

Primary areas of disagreement

[959] In terms of whether the project should proceed there is a fundamental disagreement. In the landscape assessment commissioned by HBRIC Mr Lister expressed the view that:⁵²³

“... the project will not be out-of-place in the landscape, the main elements have been appropriately designed and located, and the degree of residual adverse landscape or visual effects will be relatively modest for a project of this type.”

He maintained that view in his evidence in chief, rebuttal evidence, and concise summary.

[960] Ms Gerard was strongly opposed to the Scheme. In her view:⁵²⁴

“... the RWSS Scheme is an over-engineered solution to catchment management. The water storage scheme will have a significant adverse actual effect on the natural character and landscape patterns. In my opinion smaller

⁵²³ Landscape and Visual Effects, May 2013, at page 6

⁵²⁴ Page 1 of Exhibit 88

off-river tributary catchment water storage would provide significantly less conveyance infrastructure and be able to integrate with the terrace and plain landform and natural drainage patterns.”

Amongst other things Ms Gerard has particular concerns about fluctuating lake levels, the changed pattern of land use, and the adequacy of mitigation measures.

[961] Mr Percy⁵²⁵ is also concerned about the implications of the dam and storage lake. He traversed the objectives and policies in the operative RRMP and PC5 relating to the preservation of natural character and expressed the view that the dam did not give effect to those objectives and policies. He noted that the dam will prevent movement of sediment and that there will be effects on river morphology, both of which cannot be avoided or mitigated. He considered that the character of the Tukituki catchment would not be preserved and that this is inconsistent with s 6(a) of the RMA.

[962] Another aspect where there was a divergence of views between the landscape architects concerned the ‘bare’ zone. Ms Gerard presented a series of photo simulations to illustrate what she believed would be the visual impact of changing water levels in the lake. Three examples follow:⁵²⁶



Figure 24: Photo Simulation Presented by Ms Gerard

⁵²⁵ It was also agreed between Mr Percy and several other planners giving evidence for parties opposed to the RWSS that he would cover landscape issues.

⁵²⁶ The captions and other information form part of each photo simulation.



Figure 25: Another Photo Simulation Presented by Ms Gerard

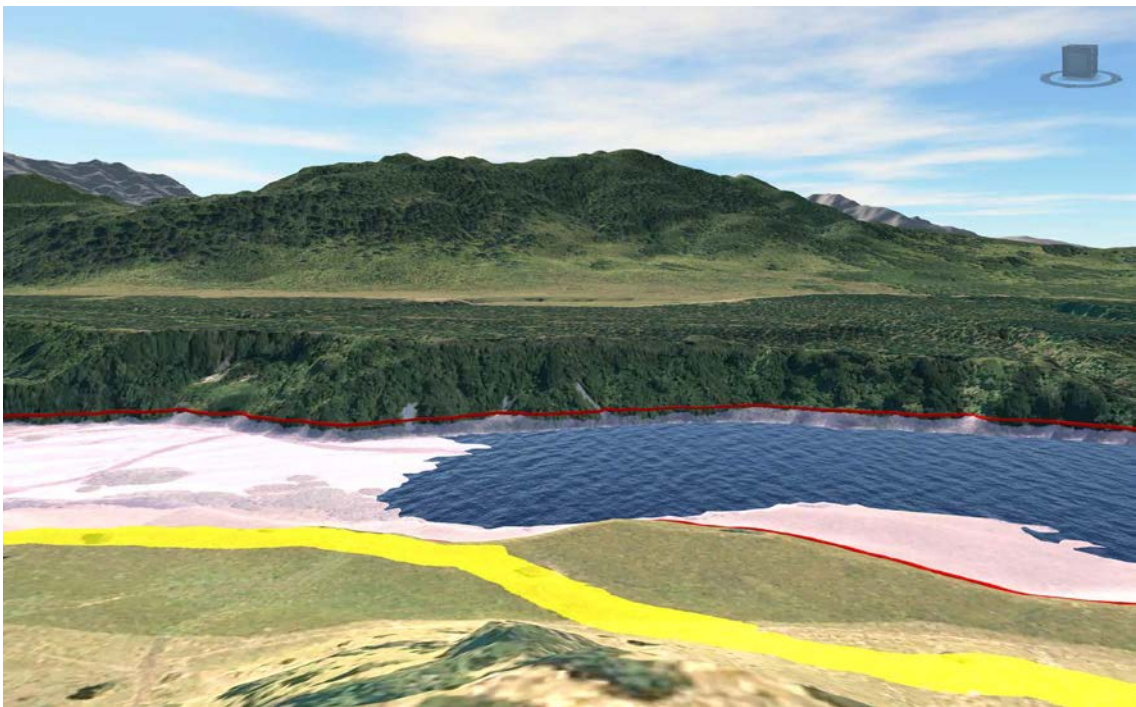


Figure 26: A further Photo Simulation Presented by Ms Gerard

The Board's findings

[963] Matters of national importance listed in s 6 include:

- (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:

- (b) The protection of outstanding natural features and landscapes from inappropriate subdivision, use, and development:

...

When considering landscape and amenity values the Board must recognise and provide for those matters to the extent that they are relevant.

[964] Those statutory provisions do not require rivers/their margins or outstanding natural features/landscapes to be preserved at all costs. Rather they are to be protected from inappropriate subdivision, use and development. In *NZ Rail Ltd v Marlborough District Council* the Court held:

“It is “inappropriate” from the point of view of the preservation of natural character in order to achieve the promotion of sustainable management as a matter of national importance. It is however, only one of the matters of national importance, and indeed other matters have to be taken into account. It is certainly not the case that preservation of natural character is to be achieved at all costs.”

By the same token the test should be rigorous.⁵²⁷ Assuming both paragraphs (a) and (b) apply, the underlying issue for the Board is whether the RWSS would be an ‘inappropriate’ development.

[965] When determining whether the paragraphs apply in this case it is convenient to begin with paragraph (b) which only applies to *outstanding* natural features and landscapes. On the question of outstanding natural features and landscapes the *Isthmus Landscape and Visual Assessment*⁵²⁸ commented that the obvious candidate was the Ruahine Ranges by virtue of their natural science, aesthetic and associative values. These ranges are identified as ‘outstanding’ in the Hastings District Plan. No other “outstanding” natural features or landscapes were identified by Isthmus. Nor was there any suggestion in the conferencing report that the reservoir would extend into features or landscapes that are ‘outstanding’.

⁵²⁷ Re an inquiry into the draft National Water Conservation (Mataura River) Order Planning Tribunal Christchurch C 32/90, 4 May 1990.

⁵²⁸ At page 15.

[966] Four ‘outstanding’ landscape views are listed in the Central Hawke’s Bay District Plan. These are views from Makaroro Road, Hardy Road, Blackburn Road and Pukura Road.⁵²⁹ None of the views involve the dam or reservoir site. For present purposes they have no relevance.

[967] The Board has concluded that in this case the issue of protecting outstanding natural features and landscapes does not arise. Therefore s 6(b) has no application. It is unnecessary to consider whether, if it had applied, the development of the dam and reservoir would have been ‘inappropriate’.

[968] But that issue does arise in relation to paragraph (a). Clearly the natural character of the Makaroro River and its margins will not be preserved in terms of that paragraph and they need to be protected from ‘inappropriate’ development. Although the dam will change the existing vista, it is at a low visibility site within modified landscapes. While the Board acknowledges Ms Gerard’s concerns about the ‘bare’ zone, it doubts that the visual outcome will be as severe as the photo simulations suggest. In any event it is likely that with the passage of time the dam and reservoir will tend to blend into the landscape. When the dam is full or near full bare zone will not be a significant feature.

[969] The Board also takes into account that an instream dam is one of the few ways that the drought problems on the Ruataniwha Plains can be addressed. Our earlier analysis of water quantity confirms that a substantial reservoir will be required. Possible locations have been extensively assessed and while there might be other locations where there might be less impact on landscape and amenity values, they have been ruled out for reasons which the Board accepts were justified. The benefit of this location is that it is on a relatively remote tributary and largely removed from public view.

[970] Mr Percy drew attention to a number of provisions in PC5 and the RRMP. Objective LW2 in PC5 is aimed at improving the integrated management of the region’s freshwater and land resources. In the Board’s view the RWSS is an example of the

⁵²⁹ Appendix 1 of the Central Hawke’s Bay District Plan.

integration of those competing resources, and is accordingly, entirely compatible with that objective. Objectives 40 and 41 of the RRMP are aimed at maintaining water quality and quantity. Although to a large extent these matters have been addressed by PC6, the minimum flow and flushing flow conditions for the RWSS are entirely compatible with those objectives. We should also add that there is nothing in PC6 that would render the dam and reservoir inappropriate in landscape terms.

[971] Taking these matters and the sustainable purpose of the RMA into account, the Board would be hard pressed to say that the development and use of a dam and reservoir at this location is ‘inappropriate’ in terms of s 6(a). To the contrary, we are satisfied that it is in fact an appropriate development, provided of course, the proposed mitigation measures are implemented.

[972] But that is not the end of the matter. It is still necessary for the project to meet the relevant ‘other matters’ requirements listed in s 7 of the RMA which include:

- (c) the maintenance and enhancement of amenity values:
...
- (f) maintenance and enhancement of the quality of the environment.
...

When assessing the applications the Board is required to have “particular regard” to these matters.

[973] We note that it is not necessary for a consent application to *both* maintain and enhance amenity values. Refer to *Shell New Zealand Limited v Auckland City Council*.⁵³⁰ ‘Amenity values’ are defined in s 2 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.

Obviously this is a very wide definition and there can be little argument that there will be some effect on those values, especially in the minds of people in the immediate vicinity of the dam or reservoir.

⁵³⁰ *Shell New Zealand Ltd v Auckland City Council* [1996] NZRMA 189 (CA).

[974] In the Board's view the effects on amenity values will be both positive and negative. As we have said earlier, the dam and reservoir will permanently alter the river valley at the dam and reservoir site. While they will tend to blend into the landscape there will nevertheless be a physical dam and a 'bare' zone which are not natural features. They will be permanent features. While planting will be beneficial, it cannot erase the reality of the bare zone or the presence of the dam.

[975] On the positive side the lake will offer amenity values, as has been acknowledged by the landscape architects. To adopt their word the reservoir will have "good" amenity value when it is full. They also agree that even at lower levels there will still be a degree of amenity value.

[976] Downstream there will be changes to flow patterns and instream effects which have already been considered in the context of water quality and quantity and aquatic ecology. We note that any effects will significantly reduce below the convergence of the Makaroro and Waipawa Rivers. Further down there will be intake structures, canals, underground pipes, and other structures such as pump sheds. The Board believes that with maturity the canal will have positive amenity values and fencing should ensure safety. Except during the course of construction the effects arising from underground piping and other structures associated with the distribution network will be minor.

[977] Inevitably there will be changes in farming practices which will impact on the amenity of the landscape. While the Board understands the concerns that Ms Gerard has raised it does not believe that they are such that s 7(a) should prompt the Board to decline consent. Despite the joint suggestion of Mr Lister and Ms Gerard the Board is not in a position to provide guidelines as to the management of those changes. It is also beyond our powers to impose conditions relating to the decommissioning of the dam at the end of its life.

Archaeological and heritage values

[978] Archaeological and heritage values were addressed on behalf of HBRIC in a report '*Ruataniwha Water Storage Scheme: Archaeological Assessment*' which was co-authored by Dr Simon Bickler and Dr Roderick Clough with a historical contribution by

Patrick Parsons.⁵³¹ Although Dr Bickler was cross-examined at some length, no expert evidence was adduced in opposition.

Outcome of the archaeological assessment

[979] Information regarding Māori sites in the region was provided by Dr Wakefield. No Māori or other pre-1900 archaeological sites were identified. Three pa sites were identified in the general vicinity of the scheme. An unnamed pā could not be identified but appears to be located several kilometres south-east of the scheme area. None of these sites would be impacted by the RWSS.⁵³²

[980] One archaeological site of early 20th century was identified within the reservoir area. This is the Gardner and Yeoman's Mill site which is located on the southern bank of the Makaroro River near Dutch Creek. The Mill operated from 1926 and for 30 years thereafter.⁵³³ Some remnants of the Mill remain.

[981] Several mitigation proposals for the Mill site were advanced in the archaeological assessment:

- Archaeological investigation and further recording of the site should be carried out before flooding;
- A report on the history of the mill (based on oral and archival sources) and the results of the archaeological investigation should be prepared and deposited in the local museum and library and the New Zealand Historic Places Trust library;
- An interpretation plan should be prepared and interpretive signage detailing the location and history of the mill should be installed in a suitable location (or locations) near the dam and reservoir that is accessible to the public. This could be associated with the existing Yeoman's Track;

⁵³¹ Archaeological Assessment, May 2013,.

⁵³² Archaeological Assessment at page 24

⁵³³ Archaeological Assessment page 30

- The boiler and any other significant industrial remains should be removed from the site prior to flooding and deposited in a local museum or installed on higher ground nearby in a location accessible to the public.

Although it was considered that the potential for archaeological remains to be exposed during construction is low, it was also recommended that comprehensive ‘accidental discovery protocols’ should be developed in conjunction with the NZ Historic Places Trust and tāngata whenua.

All these proposals were accepted by HBRIC.

Matters raised by submitters

[982] A number of submissions related to archaeological sites and heritage matters. Generally there was support for the mitigation proposals recommended in the archaeological report.

[983] During his representation Marei Apatu referred to the corridor above the dam site where many battles were fought. He told the Board:

“... during this embroilment around the early 1800s, it escalated and as typically you bring in your extended family, and so much of the history for this local area is defined and taking place right where the location of this particular dam is going to take place.

And what’s more defining are the series of pakanga and battles that take place, Mangatoetoe is in this region, followed by Mangatoetoe there was Pukekaihou, and then a series of battles from Te Aratipi which is out at Waimarama, where an evasion of those that came across Te Atua Mahuru through and over the Mokai Patea basin, down what is known now as the Colenso Track, into the base of the Makaroro, a name that we associate with the corridor from the foothills of that mountain to the passage where it meets up with the Waipawa, particularly the Makaroro, is a passage known as “Te Whiti o Tumatauenga”, a series of battles and they’re all heading to Roto-a-Tara in Pukehou.”⁵³⁴

534 Transcript at pages 3203–3204

Mr Apatu also explained that one point of entry to Heretaunga via Ruahine Ranges was a track right through the Makaroro which is a very sensitive place “and we are about to flood it.”⁵³⁵

[984] As mentioned earlier, Dr Bickler was cross-examined by counsel for NKII. Various propositions were put to the witness about matters such as best practice, whether the wider archaeological environment had been surveyed, and whether the ‘*Heretaunga Cultural Report*’ prepared by Mr Apatu had been reviewed.⁵³⁶ No specific sites were put to Dr Bickler and counsel did not mention any particular sites when closing.

[985] In Part 1⁵³⁷ we explained that at the end of the hearing memoranda were submitted by counsel for the applicant, NKII, Heretaunga and Tamatea. The second memorandum of 8 February 2014 included a protocol concerning cultural and archaeological sites which is acceptable to those parties.

The Board’s findings

[986] Under s 6(f) of the RMA the protection of historic heritage from inappropriate subdivision, use and development must be recognised and provided for as matters of national importance.

[987] The definition of “historic heritage” in s 2 of the RMA is wide ranging. Those words mean:

...those natural and physical resources that contribute to an understanding and appreciation of New Zealand’s history and cultures, deriving from any of the following qualities: ..archaeological, ..architectural, ..cultural, ..historic, ..scientific, ..technological.

The definition also expressly includes historic sites, structures, places and areas; archaeological sites; sites of significance to Māori, including wāhi tapu; and surroundings associated with the natural and physical resources.

⁵³⁵ Transcript page 3205.

⁵³⁶ Transcript at pages 80–91.

⁵³⁷ At paragraph [95] – [101].

[988] The Historic Places Act 1993 defines an archaeological site as any place in New Zealand that:

- “(a) either—
 - (i) was associated with human activity that occurred before 1900; or
 - (ii) is the site of the wreck of any vessel where that wreck occurred before 1900; and
- (b) is or may be able through investigation by archaeological methods to provide evidence relating to the history of New Zealand.”

Under s 10 of the Historic Places Act (subject to some exceptions) it is not lawful to destroy, damage or modify any archaeological site, knowing or having reasonable cause to suspect that it is an archaeological site.

[989] It is the Board’s view that the research already undertaken in relation to archaeological and heritage sites has been thorough, and that based on current knowledge, the heritage site identified is the only site that needs to be recognised and provided for in terms of s 6 of the RMA. The Board supports the recommendations in the archaeological assessment report⁵³⁸ which have been incorporated into the IMO A.

[990] It is of course possible that other archaeological sites might be identified during the project assessment or during construction. As stated by Dr Bickler, further research and monitoring strategies will be in place prior to construction and they will be under the supervision of the Historic Places Trust. The protocol accompanying the memorandum of 8 February 2014 will also be included with the conditions.

[991] On that basis the Board concludes that the effects of the RWSS on archaeological and built heritage will be less than minor, and appropriate measures to mitigate these effects have been built into the RWSS.

⁵³⁸ Ruataniwha Water Storage Scheme: Archaeological Assessment’

Coastal



Figure 27: The Tukituki Estuary

[992] Beach nourishment in the coastal marine area to maintain the functioning of the coastal environment is part of a package of offsets that have been advanced by HBRIC. A coastal permit authorising the beach nourishment is included in the matters for which consent is sought.

[993] Submissions concerning coastal and estuarine issues reflect concerns about two main issues:

- estuarine ecosystems;⁵³⁹
- coastal erosion.⁵⁴⁰

Both those issues were addressed at expert conferencing and the key recommendation that emerged was that there should be monitoring.⁵⁴¹

⁵³⁹ See Statement of Evidence of Dr Adele Whyte and Ngahiwi Tomoana on behalf of NKII at paragraphs 54–60. See McArthur rebuttal evidence for EDS.

⁵⁴⁰ See Mr Dallimore submission 316, Mr Lawrence submission 212, Mr Eyles for HBRC and Mr Johnson for Heretaunga.

[994] Māori submitters, including Ms McGuire and Mr Mulligan, emphasised the use of the estuary for fishing and mahinga kai.⁵⁴² Photographs illustrating that the estuary serves an important role as a learning tool for children in the local area were provided to the Board.⁵⁴³ Some submitters considered that there should be monitoring of Māori cultural attributes and values.

[995] For others such as Mr Dallimore and Mr Lawrence, erosion was the focus of attention. They described how this factor had already adversely affected properties in the Haumoana township⁵⁴⁴ and Mr Dallimore explained why his concerns extended to erosion at Westshore, a Napier beach.⁵⁴⁵

[996] The applicants have acknowledged the need for monitoring of the estuary and this has been included in PC6 (new Policy TT16). There is also provision in the RWSS conditions for the mouth of the estuary to be kept open.

[997] We are satisfied that beach nourishment and keeping the mouth of the estuary open will appropriately mitigate any adverse effects in the estuary or along the coastline that are attributable to the RWSS. Those steps will also give effect to the relevant objectives and policies of the New Zealand Coastal Policy Statement 2010.

Recreational

[998] Construction of the dam and reservoir will have an effect on recreational opportunities and that effect will continue once the RWSS becomes operational. Some recreational opportunities will be lost forever while new opportunities will arise.

⁵⁴¹ Joint Witness Statement for Coastal and Estuarine matters. For HBRC Cornelisen, Madarasz-Smith, for NKII Smith, and for EDS McArthur page 2

⁵⁴² Statement of Evidence of Ms McGuire on behalf of Operation Patiki And Kohupatiki Marae Paragraphs 19–24, Statement of Evidence of Tom Mulligan on Behalf of Matahiwi Marae, Paragraph 12–19.

⁵⁴³ A McQueen representation.

⁵⁴⁴ Transcript at pages 2893–2895 and 3403–3406.

⁵⁴⁵ Transcript at pages 2896–2899.

The applicant's proposals

[999] Opus International Consultants Limited provided a Recreation Assessment in May 2013.⁵⁴⁶ Evidence about this assessment was provided by Michelle Frey, a Recreational Planner.

[1000] Loss of access to recreation activities was considered to be one of the major effects arising from the RWSS.⁵⁴⁷ In recreational Zone 1 (upstream of the dam) activities such as mountain biking, tramping, day visits, hunting and fishing would be affected.⁵⁴⁸ It was recommended that alternative access should be provided and this recommendation was accepted by HBRIC.

[1001] During construction access to popular sites such as the Ruahine Forest Park will not be possible. Many submitters sought the creation of alternative access before construction commences. The Reservoir Filling and Edge Rehabilitation Plan will incorporate methods to manage this type of disruption during construction, and in the longer term.

[1002] Finally, the Recreation Assessment identifies a number of positive recreational amenities, including:

- Access to flat water for rowing and motor boat activities;
- Use of the reservoir for fishing, swimming and lakeside activities;
- Improved amenity at the Papanui Stream and potential for recreation activities and the development of walkways and cycleways along the stream.

⁵⁴⁶ Opus, Ruataniwha Water Storage Scheme: Recreation Assessment.

⁵⁴⁷ Opus, Ruataniwha Water Storage Scheme: Recreation Assessment at page 2.

⁵⁴⁸ At pages 35–37.

[1003] The IMOA was developed after the Opus report was provided. It makes provision for recreational activities⁵⁴⁹ and includes protocols for the filling of the reservoir and rehabilitation of any facilities that have been disrupted.⁵⁵⁰

[1004] Project A of Schedule 6 sets out a list of ‘proposed delivery mechanisms’ including:

- Creation of walking/cycling tracks around the reservoir, where landowners amenable;
- Construction of an access track linking the DOC track with the Ruahine Forest Park via Makaroro Road;
- Consultation with affected landowners and iwi and construction of a new picnic/camping area featuring historical/cultural information about Yeoman Mill site and surrounding landscape;
- Construction of a boat ramp;
- Construction of fisherman’s shelter.

This Schedule needs to be read alongside Schedule 9 (the Progress Plan) and Schedule 10 (the Task Schedule). All this work is scheduled to take place before construction begins.

Submitters concerns

[1005] One of the greatest concerns is the loss of access to well used tracks and camping areas. There is also anxiety about the need to obtain landowner agreement before access can be confirmed and whether this would lead to the denial of access to the Ruahine Forest Park.⁵⁵¹ It was emphasised by some submitters that legal rights of

⁵⁴⁹ HBRIC Assessment of Environmental Effects Report at p 146.

⁵⁵⁰ Opus, Ruataniwha Water Storage Scheme: Recreation Assessment at page 5.

⁵⁵¹ Federated Mountain Clubs of NZ Dennis Page Representation at pages 5–6.

access needed to be secured from the beginning and that informal access arrangements should be legalised as part of the RWSS process.⁵⁵²

[1006] A further concern related to recreational activities on the reservoir. The issue is whether it is possible for fishing and other activities to occur on a ‘working’ reservoir with variable water levels, and in any event, whether it is appropriate for such activities to take place on the reservoir.⁵⁵³

[1007] Mitigation options were discussed by Ms Frey. She was cross-examined about the absence of any recreational assessment for the lower Tukituki area and about the level of consultation with lower Tukituki hapū and marae.⁵⁵⁴

The Board’s findings

[1008] Public access to lakes and rivers is recognised under s 6(d) of the RMA which requires as a matter of national importance:

“The maintenance and enhancement of public access to and along the coastal marine area, lakes and rivers.”

The Courts have found that “access to and along” incorporates access to the surface of water as well as access to the water itself.⁵⁵⁵ Refer to the High Court decision in *Dart River Safaris Ltd v Kemp*.

[1009] The Board also notes that s 3 the Walking Access Act 2008 has the purpose of providing:

“... the New Zealand public with free, certain, enduring, and practical walking access to the outdoors (including around the coast and lakes, along rivers, and to public resources) so that the public can enjoy the outdoors.”⁵⁵⁶

This Act establishes a Commission which leads the negotiation, maintenance and improvement of walking access over public and private lands.

⁵⁵² The New Zealand Walking Access Commission Submission at pages 2–3.

⁵⁵³ See representation of G Pain (#121).

⁵⁵⁴ Transcript of evidence at pages 921–924.

⁵⁵⁵ *Dart River Safaris Ltd v Kemp* [2000] NZRMA 440 (HC) at 449.

⁵⁵⁶ Section 3 of the Walking Access Act 2008.

[1010] The Central Hawke's Bay District Plan includes an objective requiring recreational areas to be accessible and policies supporting that objective.⁵⁵⁷ It also includes a policy to the effect that residents and visitors to the district should have access to a range of recreational experiences on lakes and rivers.⁵⁵⁸

[1011] By its very nature the presence of the proposed dam and reservoir will disrupt some recreational activities that were previously enjoyed. It is therefore an essential component of any mitigation package that alternative options for access are identified so that existing tracks can be enjoyed both during the course of construction and in the long term.

[1012] Some submitters asked the Board to keep in mind the additional distance to existing recreational sites, when considering whether alternative arrangements are appropriate. As a number of submitters said, this might restrict day visit access for families and groups, thereby compromising the opportunities that should be available. The potential for recreation to occur on the reservoir (as happens in other parts of the country) was also mentioned. These include swimming, fishing, rowing and waka ama. To the extent that such opportunities are not currently available, the RWSS would deliver a positive benefit.

[1013] HBRIC has incorporated a process for identifying and mitigating the effect of the RWSS on recreation and public access. This process forms part of the conditions of consent, and experts will be utilised to progressively implement the arrangements.

[1014] The Board is satisfied that the adverse effects on recreation values and amenities will be satisfactorily mitigated and that the requirement this requirement is enshrined in conditions of consent.

Social

[1015] Included in the RWSS application suite was a Social Impact Assessment conducted by Taylor Baines & Associates. The report was prepared by Dr Taylor who provided a brief of evidence. Neither the report or his brief were directly challenged.

⁵⁵⁷ Hawke's Bay District Plan 3.3.2.1.

⁵⁵⁸ Central Hawke's Bay District Plan at 3.3.3.2.

[1016] Two particular issues were raised by submitters:⁵⁵⁹ first, lack of certainty about employment that would be generated by the RWSS; secondly, impact of changes in the community as existing farmers are replaced.

The evidence

[1017] It was noted in the Social Impact Assessment that land use change caused by the RWSS would:⁵⁶⁰

“Lead to a series of social changes driven by changes in land use, new farmers moving into the area with new or different approaches to debt and farming practices, a higher levels of employment with more intensive farming practices. While these changes will lead in turn to strengthening of local populations and communities through employment created (on and off farm) and additional business activity, including in the towns of Waipukurau and Waipawa, potential social issues could arise with land use changes around the integration of newcomers, loss of place and possible values conflicts.”

Notwithstanding this negative aspect, the report expressed the view that the RWSS would (with appropriate mitigation strategies) produce a significant net social benefit to the people and communities of the district.⁵⁶¹

[1018] A number of lay submitters were uncertain about the social change that would actually eventuate. To some extent this might be attributable to the consultation undertaken by HBRIC. It was particularly significant that Mr Preston, who supports the RWSS and who will be directly affected by it if it proceeds, emphasised that HBRIC needed to engage with the local community and had shown no inclination to do so. He considered that the local community had been left in total ignorance as to “how this project will affect us.”⁵⁶²

[1019] In July 2013 a Memorandum of Understanding regarding the management and monitoring of the socio-economic effects of the RWSS⁵⁶³ was signed by representatives of the following: HBRIC, HBRC, CHBD, HDC, Napier City Council,

⁵⁵⁹ This included representations by Jeremy Dunningham (Submission 087), Roy Boonen (Submission 261), Sustaining Hawke's Bay (Submission 363)

⁵⁶⁰ Taylor Baines and Associates “Ruataniwha Water Storage Scheme: Social Impact Assessment” Dated Final May 2013 at page 1 (Executive Summary)

⁵⁶¹ *ibid*

⁵⁶² Preston Representation at p3

⁵⁶³ Attached as Appendix 2 to Associate Professor Roger Maaka's Submitter Rebuttal.

HBDHB, Tamatea, Ministry of Social Development, Business Hawke's Bay, Hawke's Bay Chamber of Commerce, Eastern Institute of Technology and Massey University. Although signing spaces were provided for NKII and Heretaunga, neither signed.

[1020] The intent of the Memorandum of Understanding is to enable the parties to oversee the implementation and monitoring strategies identified in the Social Assessment. This includes the establishment of a RWSS Socio-economic Working Party with representatives of all the parties to the Memorandum of Understanding.

The Board's findings

[1021] In the Board's view there must be an element of conjecture about whether the predicted social effects arising from the development of the RWSS will occur. For example economic outcomes might not be assured at this stage and there is an element of uncertainty as to the precise extent that the Scheme would lead to intensification and/or transfer of farms.

[1022] That said, the proposed mitigation (in particular the strategies relating to employment, training and business opportunities) should provide opportunities that the community will be able to utilise during the construction and operation of the RWSS. If nothing else the Memorandum of Understanding and Socio-economic Working Party should prompt a step towards co-ordinating and effectively drawing as much potential as possible from the RWSS. Given Mr Preston's concerns the Board recommends inclusion of a local community representative on the working party.

[1023] On that basis the Board concludes that there will be both positive and negative social effects if the RWSS is implemented. Mitigation mechanisms should enable the community to plan for and benefit from the scheme.

Economics

[1024] Three key issues relating to economics effects were raised by submitters, namely, whether:

- overall economic effects will materialise;
- appropriate economic impact assessments were available to HBRIC;

- the financial viability of the scheme had been properly tested.

Background

[1025] In September 2012 Macfarlane Rural Business Limited (MRB) prepared a report *Ruataniwha Water Storage Project: Review of Farm Profitability*. This report addressed improvement in farm profitability that may arise from investment in the RWSS. We will refer to this as the ‘first report’.

[1026] A few months later Butcher Partners Limited prepared a report ‘*Ruataniwha Water Storage Scheme — Regional Economical Impacts and Financial Cost Benefit Analysis of the Proposed Ruataniwha Water Storage Scheme*’.⁵⁶⁴ This report provided a cost benefit analysis, an economic impact analysis, and a farmer affordability analysis. We will refer to this as the ‘second report’.

[1027] Two particular economic impacts were considered in the second report: first, those arising from the construction of the dam (one-off); secondly, those of an ongoing nature such as increases in farm production, industry processing, and benefits to the Port of Napier. It was concluded that regional GDP will increase, farm intensification would occur, job opportunities would materialise (both on and off farm), and household incomes would improve.

[1028] A number of factors were agreed at the expert conferencing. The joint report stated that the economists had agreed on the significance of agriculture and the processing industry to the Hawke’s Bay regional economy as follows⁵⁶⁵:

- “Hawke’s Bay GDP was 2.9% of national GDP;
- agriculture generated 8.9% of Hawke’s Bay Regional GDP;
- manufacturing accounts for 15.1% of regional GDP;

⁵⁶⁴ A Reports, RWSS A6.

⁵⁶⁵ Expert Conferencing Joint Witness Statement to the Board of Inquiry – Economics, 15 October 2013, page 3. paragraph 12.

- processing of dairy, meat and horticultural products accounts for 22% of manufacturing employment.”

The economists confirmed that they had relied on the budget produced by MRB when reaching these conclusions.

The evidence

[1029] Evidence for the applicants about economic effects was provided by Andrew Macfarlane who told the Board:

“.... I have found short term economics challenging due to the extensive capital costs of putting pressure on debt servicing costs and management capability. Conversely long term returns have almost always exceeded expectations as the water availability was able to leverage opportunities arising from new technology unknown at the time of development.”⁵⁶⁶

He explained⁵⁶⁷ that calculating irrigation scheme performance is part economics and part social science because “soft” factors relating to confidence are often more critical to uptake and performance than pure economics. These “soft” factors were very difficult for both economists and external commentators to quantify in advance, but very real in hindsight.

[1030] A number of submitters questioned the modelling and assumptions of Mr Macfarlane. Particular aspects that were questioned included commodity price assumptions, increased productivity assumptions, costs and affordability of water, land use assumptions, modelling of on-farm environmental mitigation costs, and absence of a review of the MRB assumptions.

The Board’s findings

[1031] It is a matter of record that Hawke’s Bay is prone to drought. The RWSS would bring a reliable supply of water that would allow individual businesses and communities to make informed decisions. It might be anticipated that certainty of supply would bring an element of confidence because risks associated with droughts would be

⁵⁶⁶ A Macfarlane, EIC, paragraph 3.7.

⁵⁶⁷ A Macfarlane, EIC, paragraph 3.38

reduced. The Board accepts Mr Macfarlane's evidence that "long term returns have almost always exceeded expectations as water availability was able to leverage opportunities arising from new technology."

[1032] While the Board needs to consider the economic impacts on communities and the costs and benefits resulting from the scheme, it is not required (or able) to determine the financial viability of the scheme. Nor can it be accurately determine the financial implications for farmers who join the scheme or the business people making consequential decisions. Those are commercial decisions for the parties involved.

[1033] All the Board can do is exercise a broad judgement about the economics of the scheme. The Board's conclusion is that if the scheme proceeds it would enable people and communities in the district to provide for their economic growth with a much greater degree of certainty than is currently possible. On the figures before the Board it has concluded that the overall economic benefits of the scheme appear to outweigh the costs and that the scheme would constitute an efficient use of the resources involved.

Cultural

[1034] Cultural issues were primarily raised by three parties: NKII and Heretaunga, who oppose the RWSS, and Tamatea, who supports it. There tended to be a blurring of cultural issues arising from PC6 and those arising from the RWSS. Consequently many of the Board's observations in Part 2 about cultural issues are equally applicable to the RWSS.

[1035] NKII and Heretaunga oppose the grant of a consent for the RWSS on four grounds:

- Inadequacy of consultation;
- No adequate assessment of effects on the lower Tukituki marae and hapū and the absence of proper monitoring;
- The conditions for mitigating or offsetting the effects on the matters of concern to the marae and hapū of the lower Tukituki are inadequate;

- The applicant has failed to demonstrate that the RWSS will achieve the purpose of sustainable management.

The first point concerning consultation will be addressed separately and no further comment is required at this stage.

Alleged inadequate assessment of effects in the lower Tukituki

[1036] The effects of the RWSS will be most pronounced in the Makaroro River. Leaving aside for the moment the question of intensification of land use, there was general agreement between the expert witnesses that below the confluence of the Makaroro and Waipawa Rivers any instream effects will be significantly reduced. And downstream of the confluence of the Waipawa and Tukituki Rivers any effects will be even further reduced.

[1037] To the extent that the concerns expressed by NKII and Heretaunga are based on the effects of land use intensification, these have already been addressed with reference to water quality. Farms participating in the scheme will have to comply with the limits imposed by PC6.

[1038] When opening the case for NKII and Heretaunga Mr Ferguson told the Board that NKII and Heretaunga supported the proposition advanced by EDS that the TRIM model was not capable of accurately predicting the effect of land use intensification on the concentration of nutrients in the rivers. However, that is no longer an issue because the limits have already been set in PC6. Apart from that, the TRIM model is not pivotal to the *on-land* nutrient limits set in PC6.

[1039] Finally, to the extent that there might have been any shortcomings in the assessment of effects in the lower Tukituki, OBJ TT16 has set in place a regime whereby tāngata whenua of the lower Tukituki will be able to exercise their kaitiaki and any effects on the mauri of the water will be monitored. These measures will be enhanced by the Kaitiaki Rūnanga conditions that the Board has added in response to the joint memorandum from counsel for NKII and Heretaunga (and others) dated 8 February 2014.

[1040] The Board does not accept the allegation that there was inadequate assessment of effects in the lower Tukituki or that there is inadequate provision for ongoing monitoring.

Allegation that conditions for mitigation or offsetting are inadequate

[1041] To a large extent this issue has already been covered. We would add that the IMOA programme has been strengthened as a result of amendments the Board has made as a result of the joint memorandum of 21 January 2013. The Board is satisfied that the mitigation and offsetting package is adequate.

Allegation that the applicant has failed to demonstrate sustainable management

[1042] Whether or not that allegation has any merit needs to wait until the Board makes its final assessment after each particular issue has been addressed.

Consultation

[1043] This issue was covered in considerable detail in Part 2 with reference to PC6. However, the situation is different when it comes to applications for resource consents and notices of requirement.

[1044] For resource consents and notices of requirement the law is stated in s 36A of the RMA:

“S 36A No duty under this Act to consult about resource consent applications and notices of requirement

- (1) The following apply to an applicant for resource consent and the local authority:
 - (a) neither has a duty under this Act to consult any person about the application; and
 - (b) each must comply with a duty under any other enactment to consult any person about the application; and
 - (c) each may consult any person about the application.
- (2) This section applies to a notice of requirement issued under any of sections 168, 168A, 189, and 189A by a requiring authority as if—
 - (a) the notice were an application for a resource consent; and

(b) the authority were an applicant.”

Consequently, even though many submitters raised the issue of consultation in strong terms, the Board can be relatively brief on this topic. It is convenient to adopt the same approach as Part 2 by considering consultation with Māori and consultation with the community separately.

Consultation with Māori

[1045] In fact there was a relatively high level of consultation with Māori which no doubt reflected that initially both PC6 and the RWSS were being progressed together as part of the Tukituki Catchment Proposal.

[1046] This consultation occurred in a variety of ways:

- through the Māori Advisory Committee;
- through the Mana Whenua Working Party;
- via marae and hapū hui;
- via hui a iwi and hui such as the Fishhook Summit called by NKII.

It is unnecessary for us to repeat what we said in Part 2 about these matters.

[1047] NKII and Heretaunga claim that HBRIC bypassed the Māori Advisory Committee in favour of engaging with Tamatea. The Board has concluded, however, that this is not borne out by the minutes of Māori Advisory Committee meetings. At a number of meetings there were presentations concerning the progress of the RWSS and feedback was sought from members of the Māori Advisory Committee (including the NKII and Heretaunga representatives).⁵⁶⁸ And that process continued after the Mana Whenua Working Party was established.

⁵⁶⁸ Exhibit 74 - Minutes of Meetings of the Māori Advisory Committee.

[1048] Consultation concerning the RWSS also occurred during the hearing process. Indeed it was as a result of discussions that the joint memorandum was lodged on 21 January 2013 (and a later memorandum was lodged on 8 February). The Board notes that this memorandum records that NKII and Heretaunga agreed that a “constructive and enduring relationship is important”.⁵⁶⁹

Consultation with the community

[1049] A relatively large number of submitters raised the issue of consultation⁵⁷⁰ and the Board accepts that they were genuinely concerned about the process. Nevertheless the Board needs to approach the matter on the basis that HBRIC was not under any legal obligation to consult.

[1050] Nevertheless there was consultation with the community, and it took many forms:

- Through the Hawke’s Bay Water Strategy and the Tukituki Choices document;
- By way of information updates through newsletters, newspaper articles and other media releases;
- Through community meetings,⁵⁷¹ which also led to the establishment of specific consultative groups to receive feedback and provide community information. These groups included the Ruataniwha Stakeholders Group, the Mana Whenua Working Party, and a wide range of community groups, landowners, the Land Use Intensification Working Party, a Pan Sector Group, the Key Farmer Reference Group and the Hawke’s Bay District Health Board. Such groups to varying degrees received regular

⁵⁶⁹ While HBRIC was not a party to that memorandum it included documents relating to the RWSS and the Board infers that the reference to a constructive and enduring relationship also applied to HBRIC.

⁵⁷⁰ Craig Preston Trust, Paul Bailey, Meg Rose, Marie Brown for the Transparent Hawke’s Bay Environmental Defence Society, Alison Dewes, Anthony Rhodes, Gilbert Zemansky, Michael Abell, Russell Death, Helen Marr for Hawke’s Bay Fish and Game Council and Eastern Fish and Game Council, Sara Gerard, Stuart Ford for Horticulture New Zealand and others, Kevin Lloyd for Te Taiao Hawke’s Bay Environmental Forum, Royal Forest and Bird Protection Society Inc, Hawke’s Bay Environmental Water Group, Mike Joy for Ngati Kahungunu Iwi.

⁵⁷¹ Approximately 19 meetings held with the Ruataniwha Stakeholder Group in Waipawa starting in May 2010, including agreement of the group to the range and content of the environmental studies undertaken to support the feasibility decision. See Final Draft Change 6 Tukituki Catchment.

updates and were able to participate and provide feedback directly in the reports undertaken for the RWSS and the project structure itself;

- By the release of environmental studies and reports prepared for the feasibility stage in September 2012;
- By the release of further documents and draft reports in March 2013 with a subsequent period for submissions and consultation prior to lodgement;
- Through an ongoing website.

While it is clear that not all feel that consultation was adequate, the reality is that HBRIC went further than it was legally obliged to go.

Section 105 (1) considerations

[1051] Section 105(1) of the RMA provides:

- (1) If an application is for a discharge permit or coastal permit to do something that would contravene section 15 or section 15B, the consent authority must, in addition to the matters in section 104(1) have regard to –
 - (a) the nature of the discharge and the sensitivity of the receiving environment to adverse effects; and
 - (b) the applicant's reasons for the proposed choice; and
 - (c) any possible alternative methods of discharge, including discharge into any other receiving environment.
- ...

The 'discharge' requiring consideration is the discharge from the dam as well as any discharges from the distribution network.

[1052] During construction the RWSS conditions should ensure that all reasonable steps are taken to avoid any adverse effect to the quality of the water flowing down the Makaroro River. As discussed earlier with reference to water quality, the expert evidence indicates that water quality, either during or after construction, is not an issue. Once the dam has been completed the reservoir will be aerated and again, there is no indication that water quality will be an issue. In short the quality of the water flowing

down the Makaroro River is unlikely to change in any significant way (except for the loss of sediment). The same will apply to any water re-entering rivers from the distribution network.

[1053] It follows that there is nothing about the nature of the discharge that justifies special attention. Nor is there anything about the sensitivity of the receiving environment that requires special consideration in the context of s 105(1).

[1054] As to the applicant's reasons for the proposed choice, this site was chosen after extensive consideration of alternative sites. This topic will be considered further in the context of alternatives.⁵⁷²

Section 107 considerations

[1055] Section 107(1) of the RMA imposes restrictions on the grant of certain discharge permits that would, after reasonable mixing, allow:

- any conspicuous change in the colour or visual clarity;
- any significant adverse effects on aquatic life.

Section 107 only applies to the “receiving water” and before the section is triggered there must be a *conspicuous* change in the colour or visual clarity of the water or *significant* adverse effects on aquatic life.

[1056] Erosion and sediment control management plans for earthworks (both in the river and on the land) are designed to prevent the discharge into water of materials that might adversely affect the colour or clarity of the water. While there is always the potential for colour or clarity issues to arise, the Board accepts that any such occurrences would be of a temporary nature and that there are satisfactory conditions requiring any such situations to be addressed.

[1057] Of the significant adverse effects on aquatic life, the restriction on fish passage is probably the most significant. However, this is not the consequence of the discharge of

⁵⁷² At paragraph [1059] – [1063].

any contaminant or water into water. Rather it is the consequence of the dam. Consequently s107 has no application.

Section 171(1) matters

[1058] As we have mentioned earlier, the Board must have regard to the matters set out in s 171(1) of the RMA, namely, whether:

- the applicant has given adequate consideration to alternative sites, routes, or methods of undertaking the work;
- the work and designation are reasonably necessary for achieving the objectives of the requiring authority for which the designation is sought.

Horticulture NZ and others opposed the NoR on the basis that there has been inadequate consideration of alternatives and that the designation would create inequality between HBRIC and other permit holders.

Consideration of alternatives

[1059] A report describing the assessment of alternatives was lodged with the NoR. The general approach was illustrated by the following step by step analysis:

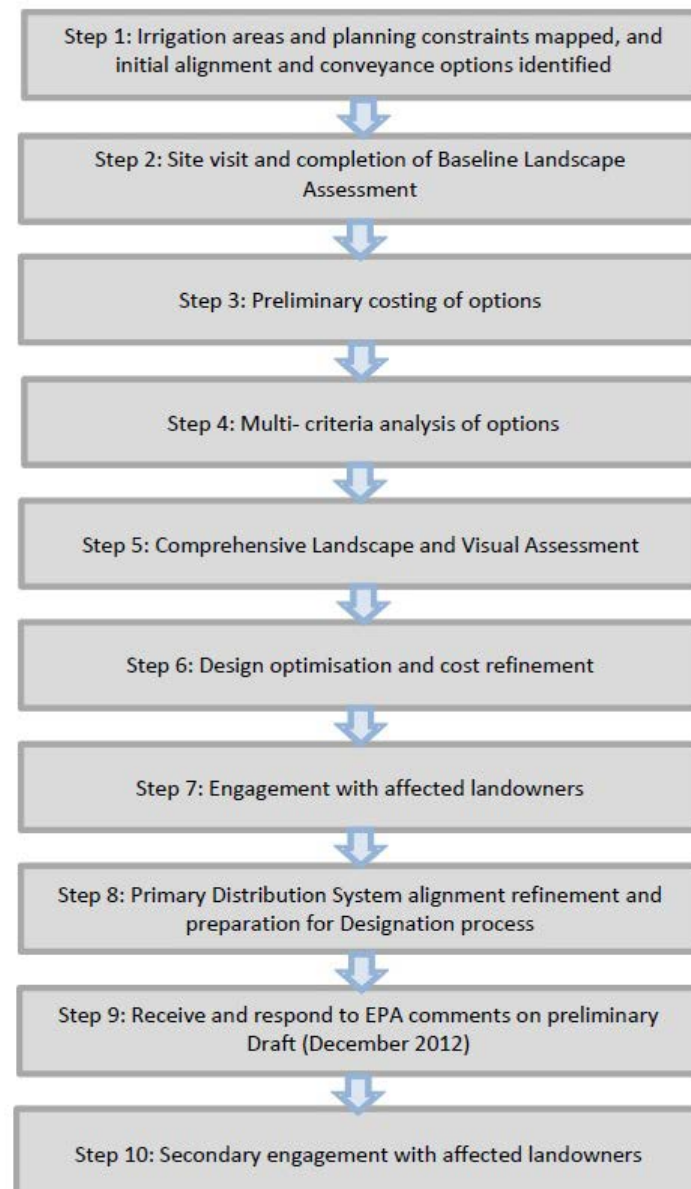


Figure 28: The Step by Step Analysis

The work involved in each step was described in detail and supported by evidence from Mr Hansen, Mr Daysh and Mr Morris.

[1060] Step 1 involved the identification of potential irrigation zones by Tonkin & Taylor and the mapping of those zones as part of a pre-feasibility study. Then possible options for the conveyance of water were considered (canals, pipes, aqueducts, and various combinations of those options) by a multi-disciplinary team.

[1061] Step 2 involved a base-line landscape assessment by Isthmus, following which indicative costs were estimated (step 3) against which the options were assessed (step 4). Following that assessment two options were selected for further design and cost analysis. Assessment of landscape, visual, archaeological, recreation, traffic, road, and noise issues was then undertaken (step 5) which was followed by the first phase of a full feasibility study (step 6).

[1062] Affected landowners were then engaged (step 7) and the primary distribution headrace canal/pipeline alignment was refined to accommodate property owners preferences (step 8). In December 2012 a preliminary draft of the alternatives assessment was provided to the EPA (step 9), following which there was further engagement with the landowners.

[1063] Given the nature of the RWSS and the need to convey water to all landowners who wished to participate, there were restraints on the alternative sites, routes and methods that were available. The Board accepts that a multi-disciplinary team undertook a thorough investigation of the available alternatives and that the requirements of s 171(1)(b) of the RMA have been met.

Whether the designation is reasonably necessary

[1064] The objective test of whether the work and designation are ‘reasonably necessary’ falls between the subjective test of expediency or desirability at one end, and absolute necessity at the other. Refer to *Gavin Wallace v Auckland City Council*.⁵⁷³ It is not necessary for the work to be ‘essential’. Refer to *Re Queenstown Airport Corp Ltd*.⁵⁷⁴

[1065] It was suggested that the designation was not reasonably necessary because the necessary protection could be achieved by conditions. The Board does not agree. The distribution network of about 36km will traverse numerous properties. It is an essential component of the RWSS and sufficient control over the lands involved is required to construct operate and maintain the network. The Board does not accept that the

⁵⁷³ *Gavin Wallace v Auckland City Council* [2012] NZEnvC 120.

⁵⁷⁴ *Re Queenstown Airport Corp Ltd* [2012] NZEnvC 206.

necessary certainty could be achieved by conditions. It is satisfied that the requirements of s 171(1)(c) of the RMA have been made out.

Other matters

[1066] Under s 176A(2)(c) of the RMA a territorial authority can waive the requirement for an outline plan. The position of the relevant territorial authority was explained by Ms Allan:

“CHBDC is simply requesting that the Board of Inquiry should not assume that CHBDC will not wish to waive the Outline Plan process for this project, and that the Board does not “lock in” conditions that require or rely on an Outline Plan.”⁵⁷⁵

The Board does not intend to ‘lock in’ conditions that would require or rely on an outline plan.

[1067] Some land incorporated in the NoR is already subject to prior designations. Under s 177(1)(a) of the RMA formal written consent is required from the existing requiring authority. The applicant has provided the necessary written approval from NZ Transport Agency.

Alternatives

[1068] Section 88(2)(b) of the RMA requires applications for resource consents to include an Assessment of Environmental Effects (AEE) in accordance with Schedule 4. Under that Schedule matters to be included in an AEE include:

- (b) where it is likely that an activity will result in any significant adverse effect on the environment, a description of any possible alternative locations or methods for undertaking the activity.

We proceed on the basis that this requirement applies.

[1069] Extensive evidence is before the Board about the possible alternative locations or methods that were studied.

⁵⁷⁵ Allan, EIC, para 22

[1070] Fourteen sites were short listed in a pre feasibility study and subsequently 4 additional sites were added. Of the 18 sites investigated, only 2 sites were considered appropriate for a full feasibility phase. These were dam sites on the Makaroro and Makaretu Rivers. The Makaroro dam site became the preferred option.

[1071] During the course of this process consideration was given to both on river dams and off river options. Economic, environmental, cultural, engineering and technical matters were assessed.

[1072] A number of submissions expressed the view that on farm storage was more appropriate than a high dam. This issue was referred to in a pre-feasibility report prepared by Tonkin & Taylor:

“... small scale storages on individual farms are possible, but they are typically much more expensive per unit of storage volume than larger shared dam storages and are not considered viable elements of a community scheme unless there is no better alternative.”⁵⁷⁶

Supporting that view, Mr Hansen⁵⁷⁷ told the Board that while on-farm storage might provide a partial solution, economies of scale favoured the larger scheme.

[1073] NKII expressed a preference for a dam at a substantially reduced scale, namely 60million cubic metres.⁵⁷⁸ No expert evidence was proffered to support this proposition. Our earlier analysis of the size of the reservoir required to irrigate the ‘command area’ suggests a smaller dam is unlikely to be a feasible alternative.

[1074] In relation to the assessment of alternative locations and methods, a decision of the High Court in *Meridian Energy Limited v Central Otago District Council*⁵⁷⁹ was brought to the attention of the Board. Amongst other things that decision indicated that consideration of alternative sites should not be pushed too far and a search for the *best site* is not required.

⁵⁷⁶ Hansen evidence in chief, section 7.2, page 12; and Hansen transcript of evidence page 184

⁵⁷⁷ Hansen, evidence in chief, chapter 18, Table 18.1

⁵⁷⁸ NKII submission 359, paragraph 14.1

⁵⁷⁹ *Meridian Energy Limited v Central Otago District Council* [2011] 1NZLR 482

[1075] The Board finds the applicant has met the requirements of Schedule 4 Clause 1(b) of the RMA.

Lapsing period for resource consents and designation

[1076] Section 125 of the RMA provides for the lapsing of consents which have not been given effect to and s 184 provides for lapsing of designations. A five year lapsing period is generally considered to be appropriate unless there is good reason to determine otherwise.

[1077] HBRIC sought a lapse period of 10 years in respect to the resource consent applications and a similar period of 10 years for the designation.

[1078] A 10 year lapse period is sought on the basis that:

- the Preliminary Construction Programme in Appendix B of the Project Description indicates a construction period of approximately four and half years;
- there will be a lead-in period prior to construction associated with completing land owner negotiations and agreements, contract management, financing, detailed design, and the finalisation of the various management plans required by the proposed consent conditions (see Part D);
- there should be an allowance be made for delays at any stage of the construction phase.

All relevant land owners are supportive of this lapse period.⁵⁸⁰

[1079] For CHBDC and HDC Ms Allan queried whether a 10 year lapse period rather than the normal statutory five year period was justified. However, she told the Board that the local authorities were not saying that the Board should not provide for a 10 year

⁵⁸⁰ Mark Chrisp, Rebuttal Evidence, at page 16, paragraph 5.9

lapse period — rather they were saying an extended lapse period requires justification and should not necessarily be granted.⁵⁸¹

[1080] The Board has considered the lapsing dates in respect to other major projects of ‘national significance’. Given the scale and complexity of the RWSS it is satisfied that a lapsing date of 10 years is appropriate.

Duration of consents

[1081] For the land use consents within the administrative jurisdiction of the CHBDC and HDC no term of consent requested. Section 123(b) of the RMA provides:

Subject to paragraph (c) the period for which for which any other land use consent ... is granted is unlimited, unless otherwise specified in the consent.

There is an expectation that subject to continued use the land use consents will endure indefinitely. The Board considers this to be appropriate.

[1082] The applicant has requested a consent duration of 35 years in relation to other consents. This is the maximum duration available and the Board considers a term of 35 years is appropriate.

Offsetting and mitigation

[1083] At the outset we believe it will assist if we set out some of the jurisprudence surrounding the concepts of offsetting and mitigation of effects on the environment.

[1084] After citing the High Court decision in *New Zealand Rail v Marlborough District Council*,⁵⁸² the Environment Court explained in *J F Investments Ltd v Queenstown Lakes District Council*:⁵⁸³

“... since activities which meet other agendas of National importance are allowable under the RMA even though they create permanent adverse effects on nationally important natural resources, it is inconsistent to suggest that environmental compensation is outside the scope of the Act. If adverse effects on the environment can be justified as providing a net benefit because they are

⁵⁸¹ Allen evidence in chief, paragraphs 26–32

⁵⁸² [1994] NZRMA 70 at 86

⁵⁸³ EnvC Christchurch C48/2006, 27 April 2006 at para [27]

in the national interest, then adverse effects offset by a net conservation benefit allowed by enhancement or the remedying of other adverse effects on the relevant environment, landscape or area must logically be justifiable also. They are certainly relevant under both s 5(2)(c) and section 7 of the RMA.”

In *Royal Forest & Bird Protection Society of New Zealand Inc v Buller District Council & Ors*⁵⁸⁴ Fogarty J said that the above exert would read the same, if instead of the phrase ‘environmental compensation’, the phrase ‘environmental offset’ was used⁵⁸⁵.

[1085] A distinction between offsetting and mitigation was drawn by Fogarty J:⁵⁸⁶

“The usual meaning of “mitigate” is to alleviate, or to abate, or to moderate the severity of something. Offsets do not do that. Rather they offer a positive new effect, one which did not exist before.”

Fogarty J explained that offsets are better viewed as a positive environment to be taken into account pursuant to s 104(1)(a) and (c) and s 5(2).⁵⁸⁷

[1086] The applicant accepts that the construction of a dam would give rise to environmental effects, particularly in relation to terrestrial and aquatic ecology and that these effects could not be mitigated through conditions. This reflects that within the footprint of the dam and reservoir the natural environment of the Makaroro River will be irreversibly changed and this cannot be avoided remedied or mitigated. Consequently the applicant intends to address these effects by the integrated management of effects approach proposed in the IMOA.

The IMOA package

[1087] The background underlying the IMOA is contained in Proposed Integrated Mitigation and Offset Approach⁵⁸⁸ This report considers numerous actual and potential effects; the loss of terrestrial indigenous vegetation; edge effects; braided river habitat; wetland habitat; loss of habitat for threatened and at risk species; loss of habitat for some indigenous aquatic species; loss of trout spawning habitat; loss of established

⁵⁸⁴ [2013] NZHC 1346

⁵⁸⁵ At para 49 of the decision

⁵⁸⁶ At paragraph 72 of the decision

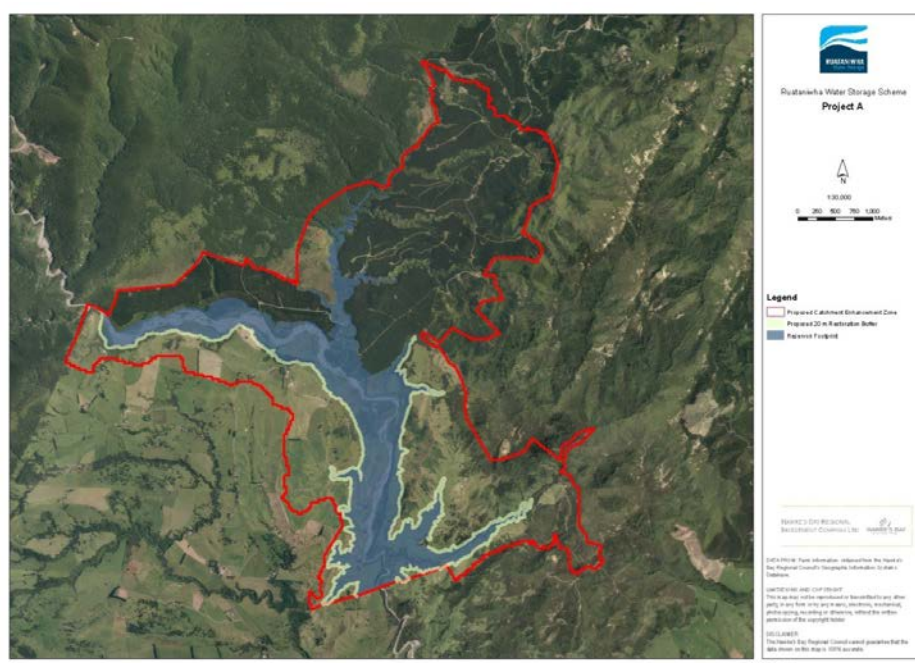
⁵⁸⁷ At [74]

⁵⁸⁸ RWSS – Integrated mitigation and offset approach May 2013

walking tracks; loss of informal camping areas; the loss at the historic mill site; loss of fish passage beyond the proposed dam; changes to the flow of the Makaroro and Waipawa Rivers; and potential increase in DRP inputs into the rivers as a result of land use intensification.

[1088] The IMOA requires the applicant to undertake five separate projects (Projects A–E) which we now outline:

- *Project A (the Ruataniwha Reservoir Restoration Buffer and Catchment Enhancement Zone)*



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Figure 29: restoration buffer and catchment enhancement zone for Project A

Project A encompasses five primary objectives.⁵⁸⁹

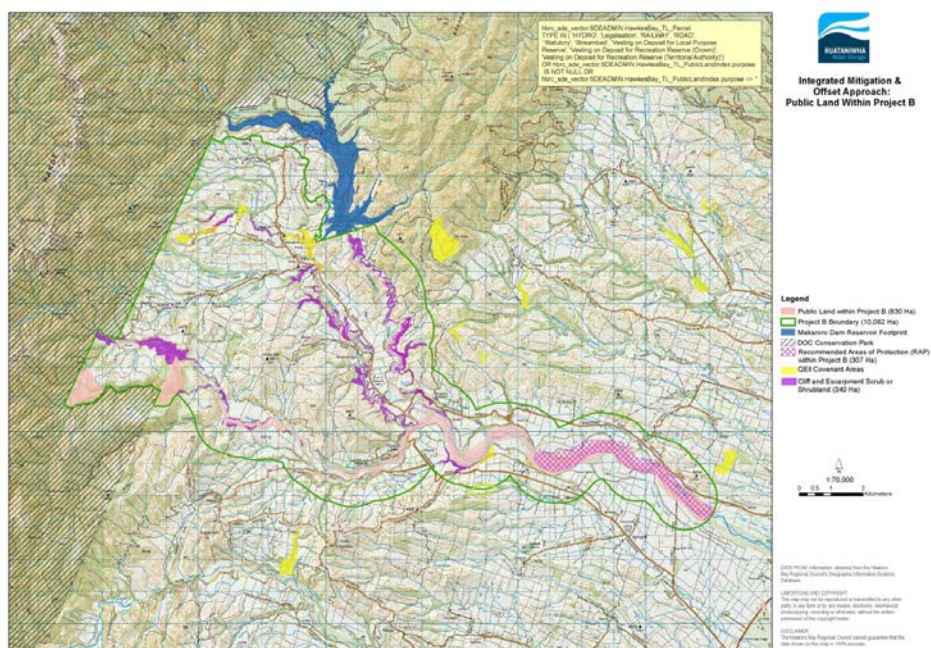
“Replanting and natural regeneration management of a buffer around a large portion of the new reservoir with indigenous vegetation – ‘Reservoir Restoration Buffer’;

Providing for targeted enhancement and restoration of remaining habitats on private land within the catchment upstream of the dam structure – ‘Catchment Enhancement Zone’;

⁵⁸⁹ Schedule Six of the conditions at i

Acknowledging the mana whenua of the Makaroro catchment and the history of the Yeoman Mill site by providing public recreation space and visual displays commemorating the history of the area.”

- *Project B (the Ruataniwha Riparian Enhancement Zone (River Halo Project))*



This package involves implementation of four biodiversity enhancement objectives including:⁵⁹⁰

“Control of willows/lupins and other braided river weeds to maintain and enhance habitat for wading birds (particularly banded dotterel) within the active channel of the Waipawa and

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Makaroro Rivers, to maintain indigenous vegetation, and to prevent the spread of weeds further downstream.

Assisting landowners to enhance and protect existing areas of wetland, bush and scrub within or contiguous with the 1km enhancement zone.

Protection and enhancement of riparian habitats alongside the Makaroro and Waipawa Rivers that are affected by flow fluctuations resulting from the project.

Enhancing the water quality of the Makaroro and Waipawa Rivers through the establishment of healthy riparian habitats within the Project area.”

Again it will be seen that the zone is very extensive compared with the proposed reservoir. The annual budget for this project is \$95,000 and the total \$1,740,000.

- *Project C (the Ruataniwha Threatened Species Habitat Enhancement Project)*

This project comprises:⁵⁹¹

“Targeted assistance programme to foster research, advocacy and habitat protection/enhancement for bats and their habitats throughout Hawke’s Bay.

Predator management programme to enhance the biodiversity values of indigenous forest and riverine areas within Project A and B (around the reservoir and downstream of the dam structure, inclusive of targeting wader bird habitats down to State Highway 50).

Trap and transfer programme focusing on native fish.”

Predator management will be within the Project A and Project B areas and will include the braded river habitats downstream of the proposed dam that are occupied by wader birds. The annual budget \$101,500 and the total budget \$3,097,500

⁵⁹¹ Schedule Six of the conditions at ix

- *Project D (the Ruataniwha Plains Spring-fed Stream Enhancement and Priority Sub-Catchment Phosphorus Mitigation and Central/Southern Hawke's Bay Wide Native Fish Passage Project).*

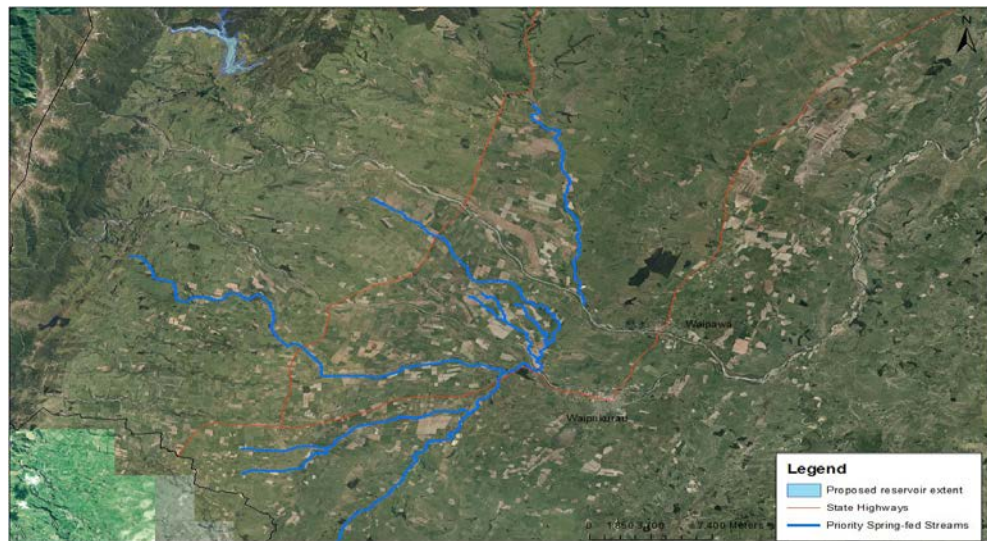


Figure 31: Priority spring fed streams

As explained in the project description the objective of this project is to:⁵⁹²

“ ... protect and enhance water quality and stream habitat in priority sub-catchments and spring-fed streams that drain the lower Ruataniwha Plains (e.g. tributaries of the lower Mangaonuku, Kahahakuri Stream, Waipawamate Stream, Black Stream, Maharakeke Stream, Tukipo River, and Porangahau Stream etc.). These streams provide good habitat for eels and other native fish species, and some are important locations for spawning and juvenile trout rearing.”

The annual budget for stream enhancement and wetland protection is \$50,000 with the total budget being \$500,000.

- *Project E (the Old Waipawa River Bed and Papanui Stream Restoration Project).*

As the name suggests, the objective of this project is to rehabilitate and enhance water quality and stream habitat in the old bed of the Waipawa River and the Papanui Stream. This aspect is closely aligned with, and a

⁵⁹² Schedule Six of the conditions at xiii

product of, the intended use of the former Waipawa River bed as the conduit or mode of delivery for irrigation water from the scheme to Zone M. Physical works will include fencing, planting, creating wetlands and maintain riparian margins. The annual cost is \$236,500 and the total cost \$1,330,000

- *Project F (Lower Tukituki Cultural Values Impact and Mitigation and Native Fish Enhancement Project)*

The objective of this project is to provide a focus for the RWSS to contribute to lower Tukituki cultural values through research, monitoring and reporting during the life of the resource consents. The work programme will involve liaison with various parties including NKII, iwi, hapu, Department of Conservation and HBRC. The annual budget is \$75,000 with a total budget of \$535,000⁵⁹³.

The evidence

[1089] According to Mr Daysh the IMOA package is the cornerstone of the RWSS proposal.⁵⁹⁴ He explained how it had been developed over a two year period beginning in the middle of 2011.

[1090] Further evidence in support of the IMOA was provided by Mr Kessels.⁵⁹⁵ He stated:

“When developing suitable mitigation and offset/compensation measures for the residual adverse ecological effects associated with the RWSS, I used the Business and Biodiversity Offset Programme (BBOP) Standard and its principles as a core objective. Application of offsetting in New Zealand has seen an adoption of several of these 10 BBOP principles in a number of projects I have been involved with over the last 5 years or so, notably the HMR Wind Farm proposal and the Dennsiton EMP appeal. The seven principles that support offsetting in the proposed draft NPS on Indigenous Biodiversity are a useful summation of how the BBOP principles can be applied in a New Zealand context.”

⁵⁹³ As will be explained under the Board’s findings, the annual budget has been increased to \$85,000 per annum and the total budget to \$885,000.

⁵⁹⁴ Daysh, EIC, p30

⁵⁹⁵ Kessels, EIC. Pp37–46

Mr Kessels said the concept of ‘no-net loss’ is the ultimate goal of a biodiversity offset approach.

[1091] It was explained by Mr Kessels that no-net loss refers to the point where biodiversity gains from targeted conservation activities match biodiversity losses due to the impact of a specific development project so that there is no net reduction in the type, amount and condition (quality) of biodiversity over space and time. A net gain occurs when biodiversity exceeds the point of no net loss. In Mr Kessel’s opinion, although no net loss is not a prerequisite for utilising an offsetting approach, it should nevertheless be regarded as a goal of good offsetting practice.⁵⁹⁶

[1092] Mr Kessels further stated that the BBOP principles have three theoretical concepts that are considered important for the successful delivery of an offset package: comparability and equivalency, additionality and permanence. He concludes by stating:⁵⁹⁷

“If the loss of the aspect of biodiversity being traded against is so significant or scarce that offsetting cannot adequately compensate for the loss accrued, then offsetting is not appropriate. I do not consider any of the indigenous habitats at issue for the RWSS fall into that category.”

[1093] Ms Frey provided evidence for the applicant as to mitigation and offsets in respect to recreational matters. She considered that, subject to changes that had been recommended, the Public Access & Offset Mitigation Progress Plan addressed the concerns of submitters and should be implemented in management plans and conditions.

[1094] When giving evidence for EDS Ms Brown described the ‘mitigation hierarchy’ and the goal of no net loss as two key concepts when it comes to applying biodiversity offsetting. She accepted, however, that these concepts are not explicitly supported by current New Zealand statute law.⁵⁹⁸

⁵⁹⁶ Kessels EIC, para 8.8 and 8.9, p39

⁵⁹⁷ Kessels, EIC, para 8.14, p41

⁵⁹⁸ Brown, EIC. P7

[1095] The mitigation hierarchy referred to by Ms Brown includes the expectation that the options of “avoid, remedy or mitigate” need to be exhausted (as far as possible) before an offset is contemplated. Ms Brown also acknowledged that achieving no net loss of biodiversity is not presently a statutory requirement in New Zealand. The Board accepts that this is an appropriate acknowledgement and that the RMA does not create a ‘no change’ regime. It tolerates a certain level of adverse effects, for example, by virtue of permitted activities.

[1096] It was Ms Brown’s view that the applicants had not undertaken a detailed assessment of the IMO A against best practise biodiversity offsetting principles. She relied on the evidence of Dr Lloyd, Dr Joy and Ms McArthur to support her criticism that the IMO A included incomplete identification of adverse effects; failed to apply limits to offsetting; lacked a robust decision-making process in formulating appropriate offset mitigation; proposed offset mitigation that is not well-defined; proposed offset mitigation gains that are insufficiently secured over time; and providing little confidence that the gains outlined are likely to be achieved.

[1097] Ms Brown concluded “The proposed positive actions outlined in the IMO A are insufficient to address the extent and nature of adverse ecological effects, resulting in significant losses to biodiversity.”⁵⁹⁹

[1098] Dr Lloyd provided expert evidence on behalf of Te Taiao Hawke's Bay Environment Forum. He considered that the mitigation proposals for terrestrial habitats placed a heavy reliance on landholder consent and largely fail to meet the ‘like for like’ principle.⁶⁰⁰ Dr Lloyd emphasised that if the project is consented and adverse effects on braided river birds and their habitat could not be avoided, stringent conditions needed to be imposed to protect and enhance braided riverbed habitat and braided river bird populations.⁶⁰¹

⁵⁹⁹ Brown, EIC, para58, p20

⁶⁰⁰ Dr Lloyd EIC at paragraph 39

⁶⁰¹ Dr Lloyd EIC paragraph 40

[1099] Many other submitters such as Ms Sage raised similar issues. Some expressly or impliedly adopted the expert testimony called by Fish & Game, Forest and Bird, Te Taiao Hawke's Bay Environmental Forum, and EDS.

[1100] The concerns of some submitters were acknowledged Mr Daysh in his rebuttal evidence. He told the Board that as a result of those concerns and other matters that had arisen during expert conferencing he had reviewed the IMOA and had prepared an updated version.

[1101] Apart from presenting rebuttal evidence from Mr Daysh, HBRC also presented rebuttal evidence on terrestrial and aquatic ecology from several experts who had not previously provided evidence. These rebuttal witnesses included Dr Craig, recently retired Professor of Environmental Management at Auckland University. In Dr Craig's opinion the greatest problem facing New Zealand species was no longer loss of habitat but rather predation by introduced species⁶⁰² and loss of breeding areas, especially arising from the growth of weeds.⁶⁰³

[1102] Under cross-examination Dr Craig reinforced this position.⁶⁰⁴

“Ms Gepp: Well, my question was some published research cites habitat loss resulting from changes in land use is the main cause in deterioration for 45 some species, you would agree that that is correct?

Dr Craig: Yes, I agree that there are a lot of papers that say this. However, I think it's important to put the context here, that we have a range of ideologies about conservation in New Zealand and one of them is an approach that doing nothing is the best way forward. Stopping change is the best way forward. And there are a lot of papers that come from that ideology and that reserving an area, so called protecting an area, is a solution.

I think New Zealand's results, we have one of the highest rates of at risk and threatened birds in the world, suggests that this approach is actually inadequate and we need a broader approach which actually deals with the other problem. We have reserved an enormous amount of land, and if you go to Clarkson and Green, that you refer to, they point out, you know, we have got the most reserve land of almost any country in the world and yet we have ongoing declines and we don't have money to actually manage that land and control predators which is overwhelmingly a major cause of the loss of birds and many other animals.

⁶⁰² See Dr Craig EIC at Paragraph 17 et seq

⁶⁰³ See Dr Craig EIC at Paragraph 25 et seq

⁶⁰⁴ Transcript at page 689 et seq

So yes, there are people who have different views, but the point is the people who just have the view that habitat loss is the key issue, I think have put us in the situation where we have these ongoing declines. We need to attack all of the issues.

Like, one of the habitat loss issues here in the Tukituki Makaroro et cetera, is the growth of weeds. Now this is taking habitat away from these birds and this project actually plans to deal with some of these, so yes, there is habitat loss in that sense in this area, so I partly agree with you, but I also want a greater emphasis put on what we know is the major cause of the loss of these birds and I personally believe if the mitigation and offset package that's been put in place, the birds will gain more than not putting it in place."

[1103] Expert witness conferencing on terrestrial ecology was held on 17 October 2013 and this resulted in a substantial number of issues being agreed. The conferencing statement records that the only areas of disagreement centred on the adequacy of the assessment of indigenous vegetation; the likelihood of other important at risk of threatened flora or fauna being present; the significance of the areas of indigenous vegetation or habitat, and whether the riverbed within the footprint of the reservoir is significant as habitat for indigenous fauna in regard to section 6(c) of the RMA.⁶⁰⁵ Importantly there was substantial agreement on virtually all aspects relating to the IMO.⁶⁰⁶

[1104] Undoubtedly there would be effects on aquatic ecology. At conferencing of the experts agreed⁶⁰⁷:

- the dam will block upstream movement of fish and reduce downstream movement;
- the proposed trap and transfer will not fully mitigate the effects of the dam on fish passage;
- there is considerable uncertainty about the efficacy of the trap and transfer regime;

⁶⁰⁵ JWS terrestrial ecology 17 October 2013

⁶⁰⁶ Ibid

⁶⁰⁷ JWS Aquatic ecology 28 October 2013

- an additional mitigation/offset would be a management plan focussing on each fish species including but not limited to enhancing fish habitat and enabling access to areas where they cannot currently access;
- the management of mitigation/offset should include Māori co-management;

Five of the eight experts believed that the proposed trap and transfer was the best available mitigation option.

The Board's findings

[1105] As will be evident from the above brief descriptions, most, if not all, of the proposed projects do not directly mitigate the effects the dam or the reservoir. Rather, applying the distinction of the Court in *Royal Forest and Bird*, they constitute offsets by way of positive new effects which do not currently exist or by way of new benefits not currently enjoyed.

[1106] There is a general consensus that if the scheme is to progress then a mitigation and offset approach is essential. The joint witness statement on terrestrial ecology records substantial agreement on most aspects of the IMO A and additions and changes have made to the original IMO A to reflect some of the points arising from submissions. One of these points was that funding would need to be provided throughout the 35 year term for which consents are sought.

[1107] The Board accepts that where possible the effects of the RWSS on the environment will be mitigated. But the reality is that environmental effects within the footprint of the dam and reservoir cannot be avoided, remedied or mitigated. Therefore offsets become an essential part of the IMO A.

[1108] Projects A–F provide for positive environmental outcomes to offset the unavoidable effects for which there is no feasible mitigation package. These packages should not be considered as ‘stand alone’ but should be viewed together with management plans and other mitigation requirements imposed by conditions. The Board views the proposed offsets involving habitat protection and enhancement, and the

control of predators and weed species as positive effects that counterbalance the inevitable loss of existing terrestrial habitat, flora and fauna.

[1109] During the hearing there was considerable discussion about offsite works that might be undertaken to provide further or better access for fish passage including the removal of barriers such as the weir on the Tukipo stream.⁶⁰⁸ The proposition was put to Mr Daysh that it would be sensible to have further guidance in the IMO A or conditions aimed at maximising the benefit for each dollar spent on remediation, rather than just looking at the lowest cost option.

[1110] Mr Daysh considered that that the sum of \$10,000 per annum for 30 years would provide an appropriate fund for this work on fish passage to be accomplished.⁶⁰⁹ Many submitters considered that sum would be insufficient. Having reflected on this matter the Board has concluded that the sum of \$10,000 per annum is inadequate and that this budgeted figure should be increased to \$20,000 per annum for the 35 year duration of the consents. We also consider that identifying areas for offset work on fish passage presents an opportunity for stakeholder input and that the IOMA should recognise this and allow for such input to prioritise works and maximise results.

[1111] Subject to that amendment, and the amendments made during the inquiry process, the Board accepts that the IMO A package is appropriate. It involves mitigation where possible and appropriate, and, where this is not possible, for offsets which will produce beneficial effects over the period of the consents. We believe that these offsets are consistent with the underlying philosophy discussed by the experts. In particular there would be no net loss as a result of the RWSS and 'like for like' benefits would accrue near the dam and reservoir

Management plans

[1112] The RWSS proposes twelve management plans by which the temporary construction effects and ongoing management of the scheme will be undertaken.

⁶⁰⁸ Transcript at p 1089 et seq

⁶⁰⁹ Transcript at page 1090

[1113] Some submitters struggled with the extensive use of such plans. There was an understandable feeling of unease regarding the use of plans that were to be formulated by HBRIC and ‘approved’ by HBRC at a later date, outside of the hearing process, particularly given the close and inter-related nature of the parties.

[1114] The reality is, however, that these days management plans have become an integral part of the framework of conditions, particularly in relation to large complex projects such as the RWSS. In an *Application by Canterbury Cricket Association Incorporated*⁶¹⁰ the Environment Court explained that the conditions of consent must identify the performance standards that are to be met in the management plan. Otherwise the management plan is likely to amount to a delegation of the decision makers role and defeat public participation in the decision making process. That approach was also adopted by the Board of Inquiry considering The MacKays to Peka Peka extension.⁶¹¹

Management plans proposed for the RWSS

[1115] Management and monitoring plans governing both the construction and future operation of the dam and distribution system are included in the conditions proposed for the RWSS. It is explained in the AEE.⁶¹²

“A *Construction Environmental Management Plan* (CEMP) which will generally follow the draft set out in Schedule Six of *Part D – Proposed Conditions*. The CEMP will be finalised once the main contractors are appointed and prior to construction commencing. The proposed conditions provide that during that finalisation process, matters of detail in the Scheme design as set out in the Project Description (*Tonkin & Taylor, May 2013a*) may change, provided the objectives and performance standards set out in the Draft CEMP and conditions are still met and any change does not cause any greater environmental effect. The proposed conditions also provide a process for more significant variations from the Scheme design as set out in the Project Description, subject to specific safeguards. In particular, it is envisaged that in the detailed design process, the exact location and the design elements of the dam structure and related diversion tunnel, spillway and power station structures may change. The proposed conditions make it clear that this is permissible provided the works occur within the area identified in the consent application plans; that the change results in an outcome which meets or exceeds the relevant specified engineering design standards, and is of no materially greater or different effect in relation to environmental outcomes. A dual certification

⁶¹⁰ Application by Canterbury Cricket Association Incorporated[2013] NZEnvC 184

⁶¹¹ Board of Inquiry: MacKays to Peka Peka Extension Final Report, 12 April 2013 at [211-213]

⁶¹² RWSS, AEE, Chapter1.4, p10

process is required whereby the engineer responsible for the Scheme design certifies that the variations meet or exceed the dam design criteria relevant to dam safety, and that opinion is confirmed by a second engineer approved by HBDC and CHBDC. A similar process is provided for changes to the upstream and downstream water intake structures, but without the added process step of a second engineer's opinion because the same potential safety issues do not arise for such changes to the design of those structures."

[1116] Without going into detail the proposed management plans are:

- *Supplementary Construction Environmental Management Plans* to ensure that an appropriate level of environmental management is applied. The principal components of the RWSS will require Supplementary Construction Environmental Management Plans. These plans are location or activity specific and would be prepared in accordance with the objectives and performance standards outlined in the draft Construction Environmental Management Plan (which forms part of the conditions);
- *An Emergency Action Plan* to ensure appropriate management of the risk associated with unplanned abnormal or excessive flow releases from the dam;
- *A Water Level Safety Plan* to detail procedures (signage, warning sirens, and public information) to warn of the risk to public safety as a result of planned sudden operational changes in river flows along the Makaroro River below the dam at locations accessible to the public;
- *A Reservoir Filling and Edge Rehabilitation Plan* to (amongst other things) minimise as far as practicable the loss of indigenous fauna and to manage the clearance of vegetation and reservoir edge erosion resulting from construction earthworks, vegetation removal and reservoir filling. This plan would also address optimisation of public access and recreation opportunities associated with the reservoir;
- *A Construction Traffic Management Plan* to ensure that traffic generated during the construction phase of the RWSS is effectively managed so that increases in traffic volume are safely accommodated within the existing road network;

- An *Infrastructure Stormwater and Maintenance Management Plan* governing stormwater management (including oil containment) and maintenance activities on structures forming part of the RWSS;
- A *Sediment Management Plan* as described in the Sedimentation Assessment⁶¹³ which deals with the management of sediment, gravel and dust arising from the RWSS;
- A *Groundwater Monitoring Plan*, to identify and monitor the quality of existing bores utilised for the supply of human drinking water prior to and following the exercise of the consents. This would include actions to be taken by scheme users upstream from such bores where there is potential to exceed Drinking Water Standards as a result of the consents being exercised;
- A *Groundwater Mounding and Drainage Monitoring Plan* to monitor groundwater mounding in areas identified as susceptible to surface and near-surface effects resulting from the groundwater table rising, and to provide for effective management of that risk;
- An *Irrigation Environmental Management Plan* and associated *Farm Environment Management Plans* which describes how irrigation users who join the scheme will be required to interact with HBRC's planned sustainable water quality regime in the Tukituki Catchment;
- An *On Farm Monitoring Plan* to cover monitoring of soil conservation on a range of irrigated and non-irrigated properties within the Ruataniwha and Papanui Basins to provide information to improve the ongoing effectiveness of the Farm Environmental Management Plans;

All of these Management and Monitoring Plans are incorporated in, or are required to be prepared pursuant to *Part D – Proposed Conditions*. The proposed conditions require each management plan to be certified by the relevant consent authorities against set objectives, performance standards and/or matters to be addressed.

⁶¹³ Tonkin & Taylor, May 2013b.

[1117] Both HDC and CHBDC expressed concern about their ability to cover the costs of consented administration and monitoring. This matter has been addressed under the proposed conditions.

[1118] Fish and Game noted that several key management plans have not been provided and are not proposed to be provided until after the resource consents have been granted. They suggested that as a consequence the Board will not have the necessary opportunity to assess whether the plans adequately address adverse effects.

The Board's findings

[1119] The relationship between HBRC and HBRIC is capable giving rise to the perception the necessary degree of independence between the regulator and applicant is not present. However, situations where a consent authority is also the local authority making the application or giving the notice of requirement are by no means unusual. Indeed, the RMA specifically provides for such occurrences.⁶¹⁴

[1120] Formation of HBRIC was driven at least in part by the need for separation between the applicant seeking approval of the RWSS and HBRC. The Board has concluded that the assessment and certification of the management plans by HBRC will require proper application of professional standards and compliance with the functions being exercised. We proceed on the basis that these functions would be exercised by HBRC with integrity and independently of HBRC.

[1121] While the Board is mindful of the concerns raised by some submitters, the reality is that many of the effects which are sought to be managed by the management plans are unable to be determined with absolute precision at this stage. Rather than indicating a lack of knowledge at this stage about the actual or potential effects of the RWSS, this state of affairs reflects other matters such as the timing or sequence of events. For example, some details might be dependent on legitimate variables within the design and construction phases with the result that the appropriate response. In each case these represent matters of detail which will not compromise the underlying conditions of consent.

⁶¹⁴ See for example s 168A which makes specific provision for territorial authorities giving a notice of requirement.

[1122] The Board considers that the use of management plans for a scheme as complex as the RWSS is appropriate. Importantly, there was substantial agreement about the management plans by the expert planners participating in the conferencing on RWSS conditions. To the extent that there was limited dissention at the expert conferencing, that dissention was due to a reluctance to accept conditions implementing the provisions of PC6 as notified, not as to the appropriateness or otherwise of the proposed use of management plans.

[1123] Having examined the suite of management plans proposed by the applicant the Board finds that in each case the conditions of consent identify the performance standards to be met and the matters to be covered. We also find that the certification of management plans by the appropriate HBRC staff members or independent certifier is consistent with well accepted practice.

Part 2 Matters

[1124] When considering the resource consents sought, the Board is required by s149P of the RMA to apply ss 104 to 112⁶¹⁵ and when considering the NoR it is required to have regard to the matters set out in s 171(1) and comply with s171(1A)⁶¹⁶. Sections 104 and 171(1) are expressly stated as being subject to part 2 of the RMA. Part 2, which comprises ss 5, 6, 7 and 8, sets out the purpose and principles of the RMA.

[1125] This means that when deciding whether or not to grant the resource consent applications it is necessary for the Board to determine whether or not the granting of those applications would achieve the purpose of the Act. Similarly, when deciding whether or not confirm the NoR seeking a designation it is also necessary for the Board to determine whether it would achieve the purpose of the Act.

[1126] The purpose of the Act is to promote sustainable management of natural and physical resources. As the Board has already found, the RWSS would give rise to both adverse and positive effects. The Board must determine whether the potential adverse

⁶¹⁵ Section 147P(2)

⁶¹⁶ Section 147P(4)

effects are minor and, if not, whether those effects can be avoided or mitigated through the conditions and/or by way of offset. Consideration must also be given to the conditions imposed on any NoR.

[1127] To inform the Board's considerations under s 5 it is obliged to consider the provisions of ss 6, 7 and 8 of the RMA which are important provisions. After considering these provisions sequentially the Board will return to the overall judgment that is required under s 5. Many of the matters relevant to ss 6-8 have been discussed earlier, but for the sake of completeness we will briefly revisit those matters.

Section 6

[1128] The Board is required to consider the matters identified in s 6 as matters of national importance. Most are relevant to the RWSS.

[1129] Even though the Board accepts that RWSS is not an inappropriate form of development, it is still necessary to consider both the adverse and positive effects. If the scheme proceeds the landscape within environment of the dam and reservoir will be permanently altered, significant vegetation and habitat of indigenous fauna will be lost, the character and flow of the Makaroro River will be changed, public access to the river will be disrupted, and the relationship between Māori and water will be affected.

[1130] Naturally the Board is concerned about the removal of significant indigenous vegetation and the loss of the significant habitat of indigenous fauna. Clearly the dam and reservoir will affect the terrestrial and aquatic ecology and the indigenous biodiversity of the surrounding area. These matters were addressed in some depth when terrestrial and aquatic ecology and mitigation/offsets were considered. The effects cannot be avoided.

[1131] Considered in isolation the RWSS would not meet s 6 (c) and it would be inconsistent with the proposed National Policy Statement on Indigenous Biodiversity. However, a range of measures have been proposed to remedy or mitigate the adverse effects. Where this is not possible the adverse effects have been counterbalanced by offsetting.

[1132] The Board accepts that there would be a change in the manner in which the public are able to obtain public access to and along the Makaroro river both during the course of construction of the dam and after the RWSS became operational. Some existing roading and tracks will be flooded, and it is proposed that new roads and tracks would be formed. Once the reservoir is filled it would provide an important flat water facility available for recreation, rowing and motor boat activities. It would also provide recreational opportunities for such things as fishing, swimming and other lake side activities.

[1133] It is accepted by the Board that the Makaroro River is of significance to iwi and hapu. The dam and reservoir would be located within the rohe of Tamatea who supports the RWSS. While the marae and hapu represented by Heretaunga are opposed to scheme, the Board is satisfied that the effects of the scheme on the lower Tukituki River would be significantly less than the effects in the vicinity of the dam. It is also satisfied that the mitigation measures accompanying the RWSS will satisfactorily mitigate any such effects.

Section 7

[1134] The Board must have particular regard to the matters listed in s 7 of the RMA.

[1135] Kaitiakitanga under s 7(a) provides for “the exercise of guardianship by the tāngata whenua” and they undertake this in accordance with their tikanga Māori and the ethic of stewardship in terms of s 7(aa). The Courts have held that ‘kaitiakitanga’ requires tāngata whenua be provided with the chance or opportunity to exercise guardianship. The Board is satisfied that arrangements entered into between HBRIC and affected Māori will give effect to the aspirations of tāngata whenua via kaitiakitanga.

[1136] As to other matters listed in s 7, the Board is satisfied that the purpose the RWSS is to achieve the efficient use and development of natural and physical resources by better utilising available resources (water and land). Fresh water is a finite resource and the RWSS seeks to manage this resource within the Tukituki catchment in a more efficient manner than it is possible in the absence of the RWSS. The RWSS also seeks to facilitate a more productive use of land which is another finite resource. In addition

the RWSS would provide a safety valve for potential climate change effects. Risks associated with droughts would be reduced.

[1137] While some existing amenity and intrinsic values of ecosystems would be lost, others will be created. These include the amenity value of the reservoir and the positive effects that would arise from the mitigation and offsetting package. In particular the environment would benefit from extensive planting and predator control, from the upgrading of the Papanui stream, and from ‘flushing flows’ which will help to combat nuisance periphyton growth.

[1138] Within the Tukituki River system the protection of trout is important. Fish passage will be obstructed by the dam and the riverine habitat above the dam will be lost through inundation. The minimum flow requirements and the proposed ‘flushing flows’ would be beneficial for the habitat of trout (which will also benefit from nutrient controls in PC6). The Board is satisfied that beyond that the IMO package will satisfactorily offset adverse effects relating to trout. These benefits also apply to native fish species.

[1139] Finally, the Board accepts that the generation of electricity associated with the RWSS will benefit the community. It will also be consistent with the National Policy Statement for Renewable Energy Generation.

Section 8

[1140] Section 8 Treaty of Waitangi requires the Board to take into account the principles of the Treaty when determining the resource consents and NoR. These principles include active protection, good faith, consultation, communication and a spirit of partnership.

[1141] When considering these matters the applications for resource consents and the NoR the Board has taken into account the principles of the Treaty of Waitangi. It believes that these principles have been properly reflected by the hearing process and by the RWSS itself. There has been a process consultation between HBRIC and the tāngata whenua and by the conclusion of the hearing it was apparent that there had been positive moves towards a more constructive and enduring relationship.

Section 5

[1142] Returning to s 5 of the RMA, it is necessary for the Board to consider all of these matters in an overall broad way, weighing both adverse and positive effects and considering all part 2 matters. As previously stated the Board needs to determine whether the potential adverse effects are minor, and if not, whether these effects can be avoided, remedied or mitigated. Having addressed specific issues, it remains for the Board to step back and exercise an overall judgement.

[1143] Having weighed relevant matters, the Board has decided that, subject to appropriate conditions, the RWSS would promote sustainable management of natural and physical resources and achieve the purpose of the Act. Given the prevalence for droughts in the region the scheme will enable people and communities in the region to provide for their social, economic and cultural wellbeing. These include the opportunity to enhance the productive capability of identified lands within the catchment, while protecting the environment.

[1144] The Board is satisfied the resource consent applications and the NoR meet the overall purpose outlined in Part 2 of the RMA.

The Ministers' reasons/information provided by the EPA

Ministers' reasons

[1] Pursuant to section 149P(1)(a) the Board is required to have regard to the Ministers' reasons for directing that the applications for resource consents and the NoR be referred to the Board.

[2] The Ministers reasons for directing the matter to the Board are set out in Part 1 of this decision. The Board has had regard to those matters when considering the resource consent applications and NoR. In particular we have taken into account that the RWSS:

- would be the largest irrigation project in New Zealand and is part of a proposal of national significance;
- would involve significant use of natural and physical resources;

- would result in significant change to the environment;
- would affect more than one district;
- is likely to be significant in terms of s8 of the RMA;
- has aroused widespread public interest regarding its actual and likely effects on the environment.

Information provided by the EPA

[1145] Under s149P(1)(b) the Board must consider any information provided to it by the EPA under section 149G. This includes the AEE, the section 149G reports undertaken by the applicant, the submissions and the Key Issue Reports provided by CHBDC and HBRC. The Board has considered this information.

Conditions

[1146] Section 108 of the RMA enables the Board to impose such conditions as it consider appropriate.

[1147] A proposed draft set of conditions was filed with the application and as a result of expert conferencing a further updated set of conditions was attached to the rebuttal evidence of Mr Daysh. At the conclusion of the hearing the applicant submitted a further proposed draft set of conditions dated 20 January 2014 in respect to the resource consent applications and the NoR. It is these final conditions that the Board has relied upon, and given consideration to.

[1148] Conditions need to be clear, certain and enforceable. The conditions need to be viewed in light of management plans and offsets previously discussed. Subject to the amendments that the Board has made, it is satisfied that the conditions are appropriate for a scheme of this size and type.

Draft Decision

[1149] Pursuant to s104B the Board grants the following resource consents subject to the conditions in volume 3 of this draft report and decision:

- **NSP 13/02. 002 (HBRC Consent Number: LU120370C):** Land use consent, water permit, and discharge permit (Makaroro Dam structure);
- **NSP 13/02. 003 (HBRC Consent Number: WP120371M):** Water permit and discharge permit (Makaroro damming, take, diversion and discharge);
- **NSP 13/02. 004 (HBRC Consent Number: LU120372C):** Land use consent, water permit and discharge permit (Upstream water intake structure);
- **NSP 13/02. 005 (HBRC Consent Number: WP120373T):** Water permit (Upstream water intake diversion and take);
- **NSP 13/02. 006 (HBRC Consent Number: LU120374C):** Land use consent, water permit and discharge permit (Downstream water intake structure);
- **NSP 13/02. 007 (HBRC Consent Number: WP120375T):** Water permit (Downstream water intake diversion and take);
- **NSP 13/02. 008 (HBRC Consent Number: LU120376C):** Land use consent, water permit and discharge permit (Structures in the beds of rivers and streams);
- **NSP 13/02. 009 (HBRC Consent Number: LU120377C):** Land use consent, water permit and discharge permit (Works in and near waterways);
- **NSP 13/02. 010 (HBRC Consent Number: LU120378C):** Land use consent, water permit and discharge permit (Mangaonuku Outfall structure);
- **NSP 13/02. 011 (HBRC Consent Number: DP120379W):** Discharge permit (Mangaonuku Outfall discharge);

- **NSP 13/02. 012 (HBRC Consent Number: LU120380C):** Land use consent, water permit and discharge permit (Kahahakuri Outfall structure);
- **NSP 13/02. 013 (HBRC Consent Number: DP120381W):** Discharge permit (Kahahakuri Outfall discharge);
- **NSP 13/02. 014 (HBRC Consent Number: LU120382L):** Land use consent (Production land use);
- **NSP 13/02. 015 (HBRC Consent Number: LU120388P):** Land use consent (Planting and associated works); and
- **NSP 13/02. 016 (HBRC Consent Number: CD120400D):** Coastal permit (Beach nourishment).
- **NSP 13/02. 018:** Land use consent (uses of land associated with construction, operation and maintenance of (a) Water storage dam, (b) intake structures, (c) outfall structures, (d) all associated earthworks, vegetation removal, road construction, plantings, storage of hazardous substances, within the jurisdiction of the CHDB); and
- **NSP 13/02. 019:** Land use consent (establishment and operation of a water reservoir on and in the vicinity of the Makaroro River within the jurisdiction of the HDC).

[1150] Pursuant to s149P(5)(b)(iii) the Board confirms the NoR (**NSP 13/02. 017**) subject to the conditions contained in Volume 3 of this draft report and decision.

[1151] The EPA is to provide a copy of this report and decision to the parties specified in s 149Q and invite comments on minor or technical matters in accordance with that section.

Dated this 10th day of April 2014



Hon Lester Chisholm

Chairman



Environment Commissioner

Russell Howie

Deputy Chairperson



Matthew Lawson

Member



Loretta Lovell

Member



Alec Neil

Member