HAWKE'S BAY REGIONAL COUNCIL

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REGIONAL COUNCIL

SAFEGUARDING YOUR ENVIRONMENT + KAITIAKI TUKU IHO

Proposed Change 6 Tukituki River Catchment

to the Hawke's Bay Regional Resource Management Plan

Adopted by Council 24 April 2013

SD 13/01
HBRC Plan Number 4464

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Proposed Change 6 to the Hawke's Bay Regional Resource Management Plan - Tukituki Catchment

Adopted by Council on 24 April 2013

Public Notification on 4 May 2013

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Tukituki Plan Change 6

PREAMBLE

The Hawke's Bay Regional Resource Management Plan (including the Regional Policy Statement) is a second generation statutory planning document, and became operative in August 2006. It identifies regionally significant issues facing the region, and sets out regional level policies and region-wide rules for addressing those issues. Within the regional plan policy provisions, there are some catchment specific water allocation limits and minimum flows and some catchment specific water quality guidelines.

Plan change 6 (Change 6) is the first of a number of catchment specific plan changes for the Hawke's Bay region which seek to implement the National Policy Statement for Freshwater Management, as well as address specific water allocation and water quality issues in the catchment.

Change 6 inserts new sections in Chapters 5 (5.9) and 6 (6.9) of the Regional Resource Management Plan relating to the Tukituki River catchment. Consequential amendments are made to the other parts of Chapters 5 and 6 of the Regional Resource Management Plan. These are also a part of Plan Change 6.

The five planning maps listed in the Schedules are contained in a separate document and form part of Plan Change 6.

Note to readers: The above Preamble and the flow charts provided to assist understanding of Rule TT1 are for explanatory purposes only and do not form part of Plan Change 6.

5.9 Tukituki River Catchment

5.9.1 Fresh Water Objectives

TT1 To sustainably manage the use and development of land, the discharge of contaminants, and the taking, using, damming, or diverting of fresh water in the Tukituki River catchment so that:

(a) River flows and water quality maintain or enhance the habitat and health of macroinvertebrates, native fish and trout;

(b) Water quality enables safe contact recreation;

(c) There are fewer occurrences of excessive periphyton growths that adversely affect recreational use and amenity;

(d) The significant values of natural wetlands are protected;

(e) The mauri of surface water bodies and groundwater is recognised and adverse effects on aspects of water quality and quantity that contribute to mauri are avoided, remedied or mitigated.

TT2 Where the quality of fresh water has been degraded by human activities to such an extent that Objective TT1 is not being achieved, to improve its quality over time.

TT3 To ensure that:

(a) As a first priority land use activities and discharges to land do not cause groundwater quality to degrade to the extent that it is unsuitable for domestic and stock water drinking purposes, or

(b) Alternatively if such degradation does occur, the water supplies of the affected people and communities are treated to an appropriate standard for the uses being made of the water or alternative potable water supplies are provided.

TT4 In recognition that the security of supply for existing surface water irrigation takes is low, to avoid any further allocation of surface water and groundwater to individual consented abstractors and not reallocate water that is freed up through the surrender or non-renewal of individuals' existing surface water and groundwater take consents.[1]

TT5 Subject to Objectives TT1 to TT3, to enable the development of Community Irrigation Schemes[2] that improve and maximise the efficient allocation and efficient use of water.

[1] This does not preclude the transfer of existing takes.

[2] References to Community Irrigation Scheme in chapter 5.9 of the RRMP means a water supply system that is capable of supplying irrigation water to at least 5,000 hectares of land.

5.9.2 Water Quality Policies

POL TT1 SURFACE WATER QUALITY LIMITS, TARGETS AND STATE INDICATORS

1. In surface water bodies[3] in Water Management Zones 1, 2, 3 and 5 Hawke's Bay Regional Council will (in Table 5.9.1B):
   (a) Set instream water quality concentration limits and targets[4] for nitrate-nitrogen (NO_3-N) to avoid toxicity effects on aquatic fauna;
   (b) Set instream water quality concentration limits and targets[4] for dissolved reactive phosphorus (DRP) and instream targets for periphyton biomass and cover (with the targets to be met by 1 July 2030).

2. In surface water bodies in Water Management Zone 4 Hawke's Bay Regional Council will (in Table 5.9.1B) set dissolved inorganic nitrogen and dissolved reactive phosphorus limits that reflect existing[5] instream water quality concentrations in recognition that the existing level of periphyton biomass and cover is currently acceptable and it should not be permitted to increase due to that Zone's existing high biodiversity values.

3. In surface water bodies[6] in all Water Management Zones Hawke's Bay Regional Council will:
   (a) Set (in Tables 5.9.1A) instream water quality limits for Temperature, Dissolved Oxygen, *Escherichia coli* (*E. coli*), Total Ammoniacal Nitrogen and Other Toxicants;
   (b) Set (in Table 5.9.1B) environmental state indicators[7] for the Macroinvertebrate Community Index (MCI), Visual Water Clarity and Deposited Sediment.
4. Manage point source discharges and the use of production land upstream of any registered drinking water supply takes to ensure compliance with the Resource Management (National Environmental Standards for Sources of Human Drinking Water) Regulations 2007 and the Drinking-Water Standards for New Zealand).

POL TT2 GROUNDWATER QUALITY LIMITS

1. For groundwater Hawke's Bay Regional Council will:
   (a) Subject to OBJ TT3, manage activities likely to affect the quality of groundwater located 10m or more below ground level in accordance with the limits for aesthetic, organic and inorganic determinands; *Escherichia coli* and nitrate-nitrogen set in Table 5.9.2;
   (b) Manage point source discharges and the use of production land upstream of any registered drinking water supply takes to ensure compliance with the Resource Management (National Environmental Standards for Sources of Human Drinking Water) Regulations 2007 and the Drinking-Water Standards for New Zealand.

[3] Excluding Lake Hatuma.
[4] "Limits" apply where the existing water quality is better than the desired numerical value and "targets" apply where the existing water quality is worse than the desired numerical value.
[5] In POL TT1 to TT15 and Rules TT1 to TT5 "existing" means as at [date of PC notification].
[6] Excluding Lake Hatuma.
[7] "Indicators" define what the state of certain water quality parameters should be in order to safeguard the life supporting capacity of the water body but they are not "limits" or "targets". The "indicators" stated will be used by Hawke's Bay Regional Council to monitor the effectiveness of the RRMP in achieving the purpose of the RMA in the Tukituki River catchment.

POL TT3 RECEIVING ENVIRONMENT LIMITS FOR POINT SOURCE DISCHARGES

1. In surface water bodies[8] in all Water Management Zones Hawke's Bay Regional Council will manage point source discharges so that after reasonable mixing, contaminants discharged (either by themselves or in combination with the same, similar, or other contaminants), do not cause the following receiving environment limits to be exceeded at any time[9] all year round:
   (a) The percentage reduction to the Quantitative Macroinvertebrate Community Index (QMCI) score relative to the QMCI upstream of the discharge should not exceed 20% at all flows;
   (b) The daily average of the five days filtered / soluble carbonaceous biochemical oxygen demand ($ScBOD_5$) shall not exceed 2 mg/L at flows less than the median flow;
   (c) The average particulate organic matter (POM) shall not exceed 5 mg/L at flows less than the median flow;
   (d) The concentration of Total Ammoniacal Nitrogen (TNH_3-N) (at pH=8.0, Temp=20°C) shall not exceed 4.3 mg/L at all flows (to avoid acute toxicity effects)[10];
   (e) The percentage reduction to the water clarity relative to the water clarity upstream of the discharge should not exceed:
      (i) 20% at flows less than the median flow in all rivers in Water Management Zone 4, 20% at flows less than the median flow in the mainstem of the Tukituki River in Water Management Zones 1 and 3 and the mainstem of the Waipawa River in Water Management Zone 2;
      (ii) 30% at flows less than the median flow in all other rivers in the Tukituki catchment.

2. The implementation of POL TT3(1) shall take into account the need to accommodate:
   (a) measurement uncertainties associated with variables such as location, flows, seasonal variation and climatic events;
   (b) in relation to discharges, the degree to which a discharge is of a temporary nature, or is associated with necessary maintenance work.

POL TT4 IMPLEMENTING THE NITRATE-NITROGEN LIMITS

1. To ensure that the Table 5.9.1B nitrate-nitrogen surface water quality limits are not exceeded, Hawke's Bay Regional Council will:
   (a) From 1 July 2013 onwards, require properties exceeding 4 hectares in area to keep the records specified in Schedule XXI so that Nutrient Budgets can be calculated using Overseer[11] (or an alternative model approved by Hawke's Bay Regional Council[12]) if required prior to 1 July 2018;
   (b) Require industry good practices (including nitrogen conversion efficiencies) to be implemented on farms in order to minimise nitrogen losses;
   (c) Recognise that the Tukituki River catchment is generally in a state of under-allocation with respect to instream nitrate-nitrogen limits therefore:
      (i) Allow a reasonable time (by 1 July 2017) for the primary industry sector to develop industry good practice nitrogen leaching rates and nitrogen conversion efficiencies for different land use, soil type and climate, and to provide industry support to farmers to prepare on-farm Nutrient Budgets;
      (ii) Include industry good practice nitrogen leaching rates and nitrogen conversion efficiencies in the Regional Resource Management Plan via a plan change prior to 1 July 2018;

[8] Excluding Lake Hatuma.
[9] "At any time" means for any single occasion that the water quality immediately downstream of the end of the reasonable mixing zone is sampled.
[10] Refer to Schedule XXIII for total ammoniacal nitrogen concentrations at other pHs and temperatures.
[11] Overseer is a nutrient budget model that calculates and estimates the nutrient flows in a productive farming system. It is owned and administered by the Ministry of Primary Industry, Fertiliser Association of New Zealand and AgResearch. The Overseer model is available at http://www.overseer.org.nz/Home.aspx
[12] To be approved by Hawke's Bay Regional Council any alternative nitrogen loss model would need to be fit for purpose for the land use, have a demonstrable repeatability of results, be field tested, and be validated to accepted scientific standards.

(iii) Provide until 1 July 2018 for the managers of existing farming operations to model nitrogen leaching rates through the preparation of Nutrient Budgets[13] which must be updated at least three yearly and provided to Hawke's Bay Regional Council;

(iv) Provide until 1 July 2020 for farms to implement any necessary changes to their farming systems to achieve industry good practice nitrogen leaching rates and nitrogen conversion efficiencies;

(d) Require the use of production land in those catchments where there are localised exceedences of Table 5.9.1B (surface water) and Table 5.9.2 (groundwater) nitrate-nitrogen targets[14] to be subject to a land use consent under Rule TT2 if the targets are still exceeded or become exceeded after 1 July 2018;

(e) Manage more than minor increases[15] in existing nitrogen leaching rates through a resource consent process under Rule TT2. Any increase in nitrogen leaching shall generally be determined relative to the greater of the following benchmarks:

(i) A whole of farm leaching rate of 15 kg/ha/year as determined by a Nutrient Budget; or

(ii) For dairying, sheep and beef, and permanent horticultural crops – the average leaching rate for the whole farm as modelled by Overseer (or an alternative model approved by Hawke's Bay Regional Council) over a two year period; or

(iii) For arable farming and cropping – the average leaching rate for the whole farm as modelled by Overseer (or an alternative model approved by Hawke's Bay Regional Council) over a seven year period;

(iv) Where records are not available to model average leaching rates for a farm, the methodology described in Schedule XXI shall be used.

(f) Categorise any use of production land as a Restricted Discretionary Activity where the increase in nitrogen leaching as modelled by Overseer (or an alternative model approved by Hawke's Bay Regional Council) exceeds the lesser of:

1. An increase of 10 % or more in leaching rate relative to the relevant Policy TT4(1)(e) benchmark; or
2. An absolute increase in leaching rate that equals or exceeds 5 kg/ha/yr.

(g) Require production land that requires a resource consent under POLTT4(1)(f) to prepare a Farm Environmental Management Plan prepared in accordance with Schedule XXII.

2. To assist with monitoring the effectiveness of POL TT4(1) the Hawke's Bay Regional Council will:

(a) Determine maximum allowable water management zone loads[16] (MAZL) for nitrogen and estimate the actual farm scale nitrogen losses in each zone using the methodology described in Schedule XIX; and

(b) Compare the farm scale nitrogen losses at a water management zone level with the MAZLs and use this information when assessing resource consent applications for the use of production land and incorporate that information in its regular state of the environment reporting.

[13] A Nutrient Budget means either:

(a) a budget prepared in accordance with the "Code of Practice for Nutrient Management (with Emphasis on Fertiliser Use), 2007" published by the Fertiliser Association of New Zealand, and which is prepared or approved by a 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 information requested by the Hawke's Bay Regional Council shall be provided in an electronic format compatible with HBRC's information systems and may include but shall not be limited to the following reports from Overseer or their equivalent if an alternative model is used: Nutrient Budget, Nitrogen, Phosphorus, Summary, Nitrogen Overview; or

(b) an auditable sector specific default nitrogen leaching rate derived from industry specific, statistically representative data for nitrogen leaching rates less than 15 kgN/ha/year.

[14] At the time of Plan Change notification, there were localised exceedences in the Kahahakuri and Mangapohio tributaries.

[15] An increase includes a single increase and cumulative increases over time.

[16] The MAZL relate to nitrogen leaching losses from the root zone of the soils farmed.

POL TT5 IMPLEMENTING THE PHOSPHORUS LIMITS AND TARGETS

1. To ensure that the Table 5.9.1B dissolved reactive phosphorus (DRP) surface water quality limits are not exceeded and to attain the Table 5.9.1B DRP targets[17] by 1 July 2030 Hawke's Bay Regional Council will:
   (a) In areas where the Table 5.9.1B DRP targets are exceeded:
      (i) Ensure existing point source discharges do not contribute any additional phosphorus load to the Tukituki River or its tributaries and through consent processes seek to reduce existing loads where necessary to progress towards phasing out the exceedence;
      (ii) Ensure any new point source discharges will not increase existing DRP concentrations in the Tukituki River or its tributaries after reasonable mixing;
   (b) In areas where the Table 5.9.1B DRP limits are not exceeded, ensure that any new point source discharges will not cause those limits to be exceeded in the Tukituki River or its tributaries after reasonable mixing;
   (c) Require any application for a resource consent for the use of production land to demonstrate:
      (i) In areas where the Table 5.9.1B DRP limits are not exceeded that the proposed activity will not lead to an exceedence of the limits in the Tukituki River or its tributaries;
      (ii) In areas where the Table 5.9.1B DRP targets are exceeded that the proposed activity will as a minimum not increase existing DRP concentrations in the Tukituki River or its tributaries;
   (d) Recognise that the middle and lower Tukituki River catchment is generally in a state of over-allocation with respect to instream DRP limits and therefore through the implementation of land use rules:
      (i) On land that is less than 15 degrees in slope; require livestock to be excluded from lakes, wetlands and permanently flowing rivers and their margins by 31 December 2017 and intermittently flowing rivers[18] and their margins by 31 December 2022;
      (ii) On land that is greater than 15 degrees in slope and where the stocking rate exceeds 18 stock units per hectare; require livestock (except sheep) to be excluded from lakes, wetlands and permanently flowing rivers and their margins by 31 December 2017 and intermittently flowing rivers and their margins by 31 December 2022.
      (iii) Require stock races crossing rivers and streams to be bridged or culverted by 30 June 2017;
      (iv) For individual properties exceeding 4 hectares in size require a Phosphorus Management Plan[19]:
         1. in the Papanui and the Porangahau catchments by 1 July 2017;
         2. in the Maharakeke catchment by 1 July 2018;
         3. in the Tukipo, Kahahakuri and Upper Tukituki Corridor catchments by 1 July 2020;
   (e) Provide land advisory services and incentives, in collaboration with the primary industry sector and the community, prioritising efforts on tributary catchments which significantly exceed the DRP targets. In particular Hawke's Bay Regional Council will:
      (i) Develop a catchment strategy and implementation plan to identify critical source areas for phosphorus and eliminate or reduce phosphorus losses;
      (ii) Encourage industry good practices to be implemented on farms in order to reduce phosphorus losses;
      (iii) Encourage riparian planting in conjunction with permanent stock exclusion fencing;

[17] The numerical values in Tables 5.9.1A and 5.9.1B are to be treated as "limits" at locations where the existing water quality is better than the relevant numerical value and as "targets" at locations where the existing water quality is worse than the relevant numerical value. At the time of Plan Change notification, only the Waipawa River and Tukituki River catchments upstream of SH50 and the Makaretu River were complying with the limits.

[18] An intermittent river does not flow continuously but has a bed that is predominantly unvegetated and comprises sand, gravel, boulders or similar material.

[19] A Phosphorus Management Plan means a plan prepared generally in accordance with industry codes of practice which identifies the inherent environmental risks on the property associated with phosphorus and sediment loss, the significance of those risks, and identifies management practices to be implemented to avoid or reduce the risks. The Phosphorus Management Plan includes a basic nutrient budget as described for Beef and Lamb New Zealand's Level 2 Land Environment Plan.

(iv) In the Water Management Zone 5 (Papanui), encourage riparian planting which provides shading for rivers and streams in order to reduce macrophyte growth and improve life-supporting capacity of the stream;

(v) Encourage surface runoff from stock races, stock yards, bridges and culverts to be diverted away from rivers and streams and discharged to land;

(vi) Encourage the preparation of Phosphorus Management Plans in catchments not listed in POL TT5(d)(iv) as a means of identifying critical source areas for phosphorus and developing site specific actions to eliminate or reduce the risk from those areas.

2. To assist with monitoring the effectiveness of POL TT5(1) the Hawke's Bay Regional Council will:

(a) Determine maximum allowable instream water management zone loads[20] (MAZL) for phosphorus using the methodology described in Schedule XIX;

(b) Determine the actual instream water management zone loads for phosphorus based on water quality and river flow monitoring data for comparison with the MAZLs and incorporate that information in its regular state of the environment reporting;

(c) In 2020 and 2025, review the need for an increased regulatory approach taking into account whether:

(i) instream DRP concentration trends indicate that the Table 5.9.1B DRP targets are likely to be met; and

(ii) the indicators set out in the Monitoring, Evaluation, Reporting and Improvement Plan[21] are being met.

POL TT6 DECISION-MAKING CRITERIA – USE OF PRODUCTION LAND

Land not Associated with the Operation of a Community Irrigation Scheme

1. When considering an application for a land use consent to authorise the use of production land not associated with the operation of a Community Irrigation Scheme, the consent authority must have regard to the following matters:

(a) Whether the applicant has supplied a Farm Environmental Management Plan prepared in accordance with Schedule XXII and that:

(i) Adequately describes the property (including soils, climate, topography and environmental risks) and the proposed land use on the property;

(ii) Contains a Nutrient Budget[22] for the property, including an assessment of the nitrogen conversion efficiency;

(iii) Describes how industry good practices will be implemented to minimise nutrient (nitrogen and phosphorus) losses, sediment losses and faecal bacteria discharges from the property and achieve a nitrogen conversion efficiency appropriate to the land use and land type;

(vii) Where the property is in Water Management Zone 5, ensures appropriate riparian management measures are implemented to minimise nutrient losses and reduce macrophyte growth in order to improve the life-supporting capacity of the river or stream;

(b) Whether conditions on the land use consent will ensure that the Farm Environmental Management Plan supplied under (a) is maintained, submitted to Hawke's Bay Regional Council as may be required by the Council, and is implemented by the property owner.

[20] In this case the MAZL relates to the annual phosphorus load as measured in the river (note this differs from the MAZL for nitrogen which relates to a leaching loss at the farm paddock (or root zone)).

[21] The Monitoring Evaluation, Reporting and Improvement Plan (MERI) is one of the key programmes of the Tukituki Catchment Implementation Plan which outlines how the non-regulatory approaches in Change 6 will be implemented.

[22] As defined in POL TT4.

Land Associated with the Operation of a Community Irrigation Scheme

2. When considering an application for a land use consent to authorise use of production land on multiple properties associated with the operation of a Community Irrigation Scheme, the consent authority must have regard to the extent to which management plan and/or contractual mechanisms governing the Scheme's operation ensure that:

   (a) In each respective Water Management Zone, the properties serviced by the Scheme will not collectively leach an amount of nitrogen that, in combination with nitrogen leached from non-Scheme properties as a result of production land use activities permitted by this Plan or authorised by consents already granted, cause the nitrate-nitrogen limits in Table 5.9.1B to be exceeded;

   (b) Where the property is in Water Management Zone 5, appropriate riparian management and wetland enhancement measures are implemented to minimise nutrient losses and reduce macrophyte growth in order to improve the life-supporting capacity of the river or stream

   (c) In each respective Water Management Zone, the properties serviced by the Scheme will collectively:

      (i) In Water Management Zones where the Table 5.9.1B DRP concentration targets are exceeded, not cause DRP concentrations in the Tukituki River or its tributaries to increase compared with a baseline measured or modelled at the time of any resource consent application;

      (ii) In Water Management Zones where the Table 5.9.1B DRP concentration limits are not exceeded, not cause those limits to be exceeded;

   (d) Any property serviced by the Scheme prepares and maintains a Farm Environmental Management Plan prepared in accordance with Schedule XXII and that:

      (i) Adequately describes the property (including soils, climate, topography and environmental risks) and the proposed land use on the property;

      (ii) Contains a Nutrient Budget for the property, including an assessment of the nitrogen conversion efficiency;

      (iii) Describes how industry good practices will be implemented to minimise nutrient (nitrogen and phosphorus) losses, sediment losses and faecal bacteria discharges from the property and achieve a nitrogen conversion efficiency appropriate to the land use and land type;

   (e) Any property serviced by the Scheme is operated in accordance with its Farm Environmental Management Plan;

   (f) Scheme-wide nutrient loss compliance modelling, auditing and enforcement procedures are implemented for nitrogen and phosphorus.

Land Use Consent Duration

3 From 4 May 2013 any land use consents granted under Rule TT2 to the landowner or occupier shall have the same expiry date as any section 14 water take irrigation consents for the land. If there are no irrigation consents for the land then the maximum duration imposed shall not exceed 35 years.

Table 5.9.1A: Surface Water Quality Limits and Targets[23] 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 where lower concentrations occur under natural conditions (e.g. in areas of groundwater upwelling including the Porangahau, Maharakeke, Kahahakuri, Mangaonuku, Papanui sub-catchments).
E.coli	260 *Escherichia coli* per 100 millilitres for the 1 November to 30 April bathing season (for flows below the median flow). 550 *Escherichia coli* per 100 millilitres for the 1 November to 30 April bathing season (for flows between the median flow and three times the median flow). 550 *Escherichia coli* per 100 millilitres for the rest of the year (for flows below three times the median flow).
Total Ammoniacal Nitrogen (TNH3-N)	The average concentration of Total Ammoniacal Nitrogen (TNH3-N) (at pH=8.0, Temp=20°C) shall not exceed 0.32 mg/L at all flows (to avoid chronic toxicity effects on freshwater clams (*Sphaerium sp*).[24] Concentration limits at other pHs and Temperatures are contained in Schedule XXIII.
Other Toxicants	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).

[23] The numerical values in Table 5.9.1A are to be treated as "limits" at locations where the existing water quality is better than the relevant numerical value and as "targets" at locations where the existing water quality is worse than the relevant numerical value.

[24].

Table 5.9.1B: Surface Water Quality Limits and Targets[25] for the Tukituki River Catchment – Zone Specific.

The Water Management Zones referred to in Table 5.9.1B are mapped in Schedule XV.
The key to Table 5.9.1B is provided below the table (page 11).

Water Management Zone	Mainstems/ Tributaries[26]	Periphyton Limits and Targets			DRP Limits and Targets	Nitrate-nitrogen Limits and Targets		DIN Limits and Targets	Indicators		
		(a)	(b)	(c)		(a)	(b)		Water Clarity	MCI	% Sediment Cover
Zone 1 Lower Tukituki and Waipawa Rivers and Tributaries (excluding Papanui Stream catchment)	Mainstems	120	30	60	0.010	2.4	3.5	n/a	2.8	100	10
	Tributaries				0.015				1.6	100	n/a
Zone 2 Middle Waipawa River and Tributaries above SH2	Mainstems	120	30	60	0.010	3.8	5.6	n/a	3.0	120	10
	Tributaries				0.015				1.6	100	n/a

[25] The numerical values in Table 5.9.1B are to be treated as "limits" at locations where the existing water quality is better than the relevant numerical value and as "targets" at locations where the existing water quality is worse than the relevant numerical value.

[26] Mainstems include the following rivers:

- Zone 1 mainstem of the Tukituki River
- Zone 2 mainstems of the Waipawa River and Mangaonuku Stream
- Zone 3 mainstems of the Tukituki and Tukipo rivers, and the Maharakeke, Porangahau, Makaretu and Kahahakuri streams.

Water Management Zone	Mainstems/ Tributaries[27]	Periphyton Limits and Targets			DRP Limits and Targets	Nitrate-nitrogen Limits and Targets		DIN Limits and Targets	Indicators		
		(a)	(b)	(c)		(a)	(b)		Water Clarity	MCI	% Sediment Cover
Zone 3 Middle Tukituki River and Tributaries above Tapairu Road	Mainstems	120	30	60	0.010	3.8	5.6	n/a	3.0	120	10
	Tributaries				0.015				1.6	100	n/a
Zone 4 Upper Tukituki and Waipawa Rivers	All	50	30	60	0.004	n/a	1.5	0.150	3.3	120	10
Zone 5 Papanui Stream	All	120	30	60	0.015	2.4	3.5	n/a	1.6	100	n/a

The Water Management Zones referred to in Table 5.9.1B are mapped in Schedule XV.
The Key to Table 5.9.1B is provided below.

[27] Mainstems include the following rivers:
- Zone 1 mainstem of the Tukituki River
- Zone 2 mainstems of the Waipawa River and Mangaonuku Stream
- Zone 3 mainstems of the Tukituki and Tukipo rivers, and the Maharakeke, Porangahau, Makaretu and Kahahakuri streams.

Key to the Table 5.9.1B limits, targets and indicators:

Periphyton:

(a) Maximum algal biomass on the river bed in milligrams of chlorophyll a per square metre not to be exceeded within a 30 day accrual period.

(b) Maximum cover (%) of visible river bed by periphyton as filamentous algae more than 2 centimetres long within a 30 day accrual period..

(c) Maximum cover (%) of visible river bed by periphyton as diatoms or cyanobacteria mats more than 0.3 centimetres thick within a 30 day accrual period.

Phosphorus:

Maximum annual average concentration of dissolved reactive phosphorus (DRP) when the river flow is at or below 3 times the median flow (mg DRP/L). The annual average concentration of DRP shall be calculated as the average of monthly monitoring results obtained over a period of 5 consecutive years.

Nitrogen:

(a) Maximum annual median concentration of nitrate-nitrogen (mg NO_3-N /L). The annual average concentration of nitrate-nitrogen shall be calculated as the average of monthly monitoring results obtained over a period of 5 consecutive years.

(b) Maximum 95th percentile concentration of nitrate-nitrogen (mg NO_3-N /L). The 95th percentile concentration of nitrate-nitrogen shall be calculated as the 95th percentile of monthly monitoring results obtained over a period of 5 consecutive years.

Dissolved Inorganic Nitrogen:

Maximum annual average concentration of dissolved inorganic nitrogen (mg DIN /L) when the river flow is at or below 3 times the median flow.

Water Clarity Indicator:

Minimum median visual water clarity at or below median flow (m), measured as the horizontal sighting range of a black disc.

MCI indicator: Minimum average macro-invertebrate community index

% Sediment Cover indicator: Maximum average % fine sediment cover where 'fine' is defined as particles less than 2 mm in diameter (excludes naturally soft bottom streams)

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

Aesthetic determinands	*E.coli*	Nitrate-nitrogen	Nitrate-nitrogen	All other determinants
Guideline value for any aesthetic determinand [Drinking-Water Standards for New Zealand (DWSNZ)]	Maximum concentration of Escherichia coli per 100 millilitres	Maximum 95th 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)

Note: These limits apply after reasonable mixing and disregarding the effect of any natural conditions that may affect the water body.

5.9.3 Water Quantity Policies

POL TT7 MINIMUM FLOW LIMITS

1. In Surface Water Allocation Zones 1, 2 and 3:
   (a) The minimum flow limits in Table 5.9.3 shall apply to consented takes; including consented groundwater takes with High Stream Depletion Classification as described in POL TT11, but excluding Community Irrigation Schemes[28] which involve storage of water behind an instream dam and High Flow Allocation takes as described in POL TT10;
   (b) Transition periods shall be provided to implement increased minimum flows as shown in Table 5.9.3, to provide existing water users a reasonable time to adapt to the reduced security of supply or find alternative sources of water;
   (c) Subject to (d) below, consented takes from the mainstems of the Tukituki and Waipawa Rivers shall be subject to the downstream minimum flows for the mainstems set in Table 5.9.3. Takes from tributaries shall be subject to both the mainstem minimum flow and the relevant tributary minimum flow set in Table 5.9.3.
   (d) Consented takes downstream of the Red Bridge flow management site (Waimarama Rd) shall be subject to the minimum flow limit at the Red Bridge flow management site except for consented takes below Black Bridge (Mill Rd) which shall not be subject to minimum flow restrictions set in Table 5.9.3;
   (e) Where a Community Irrigation Scheme stores water and subsequently releases it into a river for use by members of the Scheme, other (non-Scheme) takes from that river will be managed by using a river flow (for the purpose of comparing to the allowable Table 5.9.3 minimum flow) calculated or modelled by Hawke's Bay Regional Council to be that which would have occurred in the absence of the Scheme. This will ensure that water stored and released by the Scheme is used by Scheme participants and is not taken by other users.

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 high degree of interconnectedness between groundwater in the Ruataniwha Basin and surface water flows within the basin 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).

[28] Refer Policy TT13 for the requirements that Community Irrigation Scheme must meet.

Table 5.9.3: Tukituki River Catchment Minimum Flow Limits

Surface Water Allocation Zone	Flow Management Site	Level of habitat protection	Minimum Flow Limit (L/sec)	Period to which Minimum Flow applies
Zone 1 Lower Tukituki	Tukituki River at Red Bridge	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	90% habitat protection for longfin eel (estimated equivalent)	53	Ongoing
Zone 2 Waipawa River	Waipawa River at RDS/SH2	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	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	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	Current level of protection	150	Ongoing
Zone 3 Tukipo River	Tukipo River Ashcott Road	90% habitat protection for highest flow demanding fish species (estimated equivalent)	1043	From 1 July 2018

Table 5.9.4: Surface Water Allocation Limits[29]

Surface Water Allocation Zones (Schedule XVI)	Allocation Limit (L/sec)	Allocation Limit Annual Volume (Thousand m3)
Zone 1 - Lower Tukituki River	1,072	4,703
Zone 2 - Waipawa River and Tributaries above RDS/SH2	908	7,301
Zone 3 - Tukituki River and Tributaries above Tapairu Road	1,122	8,385
Sub- catchment allocation of allocation limit for Zone 3:		
Zone 3 - Kahahakuri Stream	229	653
Zone 3 – Makaretu Stream	70	107
Zone 3 - Tukipo River	152	5168
Total catchment	3,102	20,389

Table 5.9.5: Groundwater Allocation Limits[29]

Groundwater Allocation Zones (Schedule XVII)	Allocation Limit (m^3/year)
Zone 1 – Otane Basin	2,553,000
Zone 2 – Ruataniwha Basin north of the Waipawa River	5,278,000
Zone 3 – Ruataniwha Basin south of the Waipawa River	16,167,000
Rest of the catchment	No limit set[30]

POL TT9 IMPLEMENTING MINIMUM FLOWS AND ALLOCATION LIMITS

1. To implement the minimum flow limits 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 volume of take;
      (ii) A seasonal volume[31] on irrigation takes is imposed which is the lesser of the volume assessed:
         i. in accordance with POL 42; or
         ii. using the procedure set out in Schedule XVIII;
      (iii) Annual volumes on non-irrigation takes are imposed.
   (b) Seeking to improve the security of supply for existing surface water takes by not reallocating water that is freed up through[32]:
      (i) The surrender or non-renewal of existing takes;
      (ii) The implementation of POL TT9(1)(a).
   (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 s14(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 s14(3)(b) takes for animal drinking water in the event of a Community Irrigation Scheme progressing.

[29] The Table 5.9.4 and 5.9.5 water allocation limits apply only to consented takes and not to takes allowed under section 14(3)(b) of the RMA, nor to takes occurring prior to [date of PC notification] under Rules 53 and 54, and nor to takes for Community Irrigation Schemes.
[30] Groundwater takes located outside of Groundwater Allocation Zones 1 to 3 are Discretionary Activities under Rule TT4.
[31] Seasonal volume is the actual crop water requirement required over a crop's growing season (including any crop rotation).
[32] This does not preclude the transfer of existing takes.

(f) Other than for takes for Community Irrigation Schemes[33] which involve storage of water behind an instream dam, when a river is at or below its Table 5.9.3 minimum flow, takes from that river 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 by an amount 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;
   (v) All other consented takes shall cease.

POL TT10 HIGH FLOW ALLOCATION LIMITS

1. To enable the taking of surface water from rivers that are flowing at a level above their median flow provided:
   (a) The high flow take ceases when the river is at or below the High Flow Minimum Flow Limit[34] as set in Table 5.9.6;
   (b) Such high flow takes do not cumulatively exceed the allocation limits set in Table 5.9.6;
   (c) The restrictions in (a) and (b) above do not apply to takes for Community Irrigation Schemes which involve storage of water behind an instream dam.

Table 5.9.6: High Flow Allocation and Minimum Flow Limits

River name	Flow Management Site	High Flow Minimum Flow Limit (L/sec)	High Flow Allocation Limit (L/sec)	High Flow Allocation Limit (m^3/day)
Tukituki River	At Red Bridge	22,022	2000[35]	172,800[32]
Tukituki River	At Tapairu Road	9,892	500	86,400
Waipawa River	At Waipawa (RDS/SH2)	8,991	500	86,400

[33] Refer Policy TT13 for the requirements that Community Irrigation Scheme must meet.
[34] The High Flow Minimum Flow has been set at the median flow for each Flow Management Site.
[35] The allocation limit above the Red Bridge site is a cumulative one in so far as it includes the allocation limits above the Tapairu Road and Waipawa (RDS/SH2) sites.

POL TT11 MANAGING GROUNDWATER TAKES HYDRAULICALLY CONNECTED TO SURFACE WATER BODIES

1. To generally manage the effects of groundwater takes on surface water bodies, including wetlands, in the following manner:
   (a) An appropriate scientific method must be used by consent applicants to assess the depletion effect of the groundwater take on nearby surface water [36] e.g.: using Guidelines for the Assessment of Groundwater Abstraction Effects on Stream Flow prepared by Environment Canterbury (Techniques for evaluating stream depletion effects, Supplement to the guidelines for the assessment of groundwater abstraction effects on stream flow (2000), Report No. R09/53, ISBN 978-1-86937-992-6);
   (b) Subject to (a), the potential adverse effects of groundwater takes on surface water depletion shall be managed in accordance with Table 5.9.7;
   (c) Groundwater takes that are classified as High or Medium in Table 5.9.7 shall be included within the surface water allocation limits described in POL TT8 and POL TT9;
   (d) Groundwater takes that are classified as High in Table 5.9.7 shall be subject to the minimum flow limits in POL TT7 and POL TT9, provided that the predicted reduction in stream depletion that will arise from ceasing the groundwater take will occur within 10 days.

Table 5.9.7: Management of Surface Water Depletion Effects

Classification of surface water depletion effect	Magnitude of surface water depletion effect	Management approach
High	The surface water depletion effect is assessed as: (a) 50% or greater of the average groundwater pumping rate[37] after 100 days of pumping; and (b) greater than 1 L/s.	The calculated loss of surface water is included in the surface water allocation regime, and specific minimum flow restrictions are imposed on the groundwater take, subject to the proviso in POL TT11(1)(d).
Medium	The surface water depletion effect is assessed as: (a) 20% or greater and less than 50% of the average groundwater pumping rate[34] after 100 days of pumping; and (b) greater than 1 L/s.	The calculated loss of surface water is included in the surface water allocation regime, but no specific minimum flow restrictions are imposed on the groundwater take.
Low	The surface water depletion effect is assessed as: (a) less than 20% of the average groundwater pumping rate after 100 days of pumping; or (b) 1 L/s or less.	The calculated loss of surface water is not included in the surface water allocation regime, and no specific minimum flow restrictions are imposed on the groundwater take.

[36] Prior to this assessment occurring takes that have previously been assessed by HBRC as being stream flow depleting takes will be categorised as Table 5.9.7 "High" takes. The assessment method selected should be appropriate to the likely risk of stream depletion.

[37] The average groundwater pumping rate is based on the seasonal or annual volume averaged over 100 days or full year whichever is applicable assuming pumping occurs for 24 hours per day

POL TT12 TRANSFERS

1 To maximise the efficient use of water and improve security of supply by:

(a) Enabling the transfer of existing take consents to other sites within the same Surface Water Allocation Zone, Groundwater Allocation Zone or aquifer system;

(b) Enabling the management of temporary transfers within an irrigation season by a management entity approved by Hawke's Bay Regional Council where the metering of takes and the telemetry of take data allows for real time management and monitoring of the water being taken.

POL TT13 ENABLING COMMUNITY IRRIGATION SCHEMES

1. Enabling takes for Community Irrigation Schemes capable of providing irrigation water to at least 5,000 hectares of production land provided that the management of the take and the management of the Scheme:

(a) Demonstrates how the supply of irrigation water and the resulting use of irrigated land will meet the limits and targets set by POL TT1 and POL TT2;

(b) Does not increase the number of days that downstream takes will be required to cease abstraction (or reduce their rate of take) as a result of Hawke's Bay Regional Council implementing POL TT9(1)(f);

(c) Provides water for future irrigation demand at a security of supply described in POL TT8(1)(a), taking into account the effects of climate change;

(d) Ensures that water is available at a rate and quality sufficient to meet the domestic and stock water needs of any properties whose existing water supply is rendered unsuitable for human or animal drinking as a result of the implementation of the Community Irrigation Scheme, or alternatively ensures affected water supplies are appropriately treated;

(e) Demonstrates industry good practice for irrigation scheme efficiency;

(f) Maintains or enhances terrestrial riparian biodiversity and surface water recreational opportunities within the catchment;

(g) Avoids, remedies or mitigates adverse effects on aspects of water quality and quantity that contribute to mauri in rivers and streams affected by the operation of the Community Irrigation Scheme.

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 TT13, 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 [38];

(c) From 4 May 2013 the renewal of existing surface take consents, and the renewal of existing groundwater take consents within Groundwater Allocation Zones 1 to 3 shall be a Discretionary Activity under Rule TT4 provided that the Table 5.9.4 and 5.9.5 Allocation Limits are not exceeded and renewed production land irrigation consents shall have durations not exceeding 5 years;

(d) From 4 May 2013 the taking of water for a Community Irrigation Scheme capable of providing irrigation water to at least 5,000 hectares of production land shall be a Discretionary Activity under Rule 55 and if granted the consent duration should reflect the capital investment required for the Scheme and may be up to 35 years;

[38] Note that taking groundwater as a permitted activity under Rule 53 is still allowed within the Tukituki River catchment.

(e) Other than for:

a. high flow takes (POL TT10);

b. takes for the purpose of Community Irrigation Schemes;

c. takes under Rule 53; and

d. takes allowed under section 14(3)(b) of the RMA which have as their primary purpose the provision of drinking water for people or animals;

e. takes permitted under Rule TT3

from 4 May 2013, the taking of any new surface water and new groundwater within the Surface Water and Groundwater Allocation Zones shall be a Non-complying Activity under Rule TT5;

(f) From 4 May 2013, the renewal of existing groundwater take consents and the taking of new groundwater outside the Groundwater Allocation Zones (except as provided for by Rule TT3) shall be a Discretionary Activity under Rule TT4 and if granted the consent duration shall be no more than 5 years;

(g) Consent conditions shall be imposed that limit the instantaneous rate of take, the monthly and seasonal volume of take for irrigation takes, and the annual volume of take for non-irrigation takes;

(h) Single resource consents may be granted to cover multiple uses of water.

POL TT15 WATER MEASURING AND REPORTING REQUIREMENTS

1. Except as provided for in POL TT15(3), all consented takes from surface water or groundwater shall be measured as follows:

(a) Water meters shall be installed, in accordance with industry good practice and the most current version of the Hawke's Bay Regional Council's Technical Specifications and Installation Requirements for Flow Meters, where:

(i) The authorised rate of take is 5 L/s or greater; or

(ii) The take is subject to a minimum flow cessation condition.

(b) Any single mobile pumps or take systems that are used on more than one property or for more than one take consent and a water meter is required in accordance with POL TT15(1)(a), an integral tamperproof GPS location of the mobile irrigator's position with data provided at 15 minute intervals is required.

(c) To enable accurate measurement of consent take volumes, if a single bore or surface water takepoint is being used for consented takes and a take permitted by section 14(3) of the RMA, then the water used for section 14(3)(b) purposes shall be physically drawn off before the water meter, or another water meter shall be fitted to measure the section 14(3) component of the overall take.

(d) The meter shall have an installed accuracy with no more uncertainty than +/-5%.

(e) The meter shall be sealed and made tamperproof to minimise the possibility of the meter or any adjacent components (e.g. data-loggers and telemetry equipment) being dismantled, altered or removed without visibly damaging the protective devices.

(f) The meter shall be verified to be accurate every five years:

(i) A verification device with no more uncertainty than +/-3% in the measurement shall be used to determine the insitu accuracy of the meter;

(ii) Flow rigs shall be used for all verification tests, unless a more suitable method has been approved by the Hawke's Bay Regional Council;

(iii) All new or newly modified headworks shall provide provision for a flow rig to be attached.

(g) The meter must be connected to a telemetry device fitted so that it is compatible with the Hawke's Bay Regional Council's telemetry system if one or more of the following apply:

(i) The take is subject to a minimum flow limit (including high flow allocation takes);

(ii) The consent covers multiple properties and associated takepoints;

(iii) Single mobile pumps or take systems are used on more than one property or for more than one take consent;

(iv) The consent is one of a number of consents where temporary transfers are being managed by a management entity approved by Hawke's Bay Regional Council as provided for in POL TT12;

(v) The consent is in a surface water or groundwater allocation zone defined by Schedule XVI and XVII;

(vi) The take is classified as having High or Medium Stream Depletion Effects as defined by POL TT11;

(vii) Telemetry is considered necessary by the consent authority to ensure compliance with conditions of consent.

(h) Should any parts of any water meter and telemetry component fail, they shall be replaced by new or temporary replacement parts within 7 days so that full operational status is able to achieved.

2. Except as provided for in POL TT15(3), all consented takes that are required to be measured in accordance with POL TT15(1) shall generally be recorded and reported as follows:

(a) Where the meter is connected to a telemetry device in accordance with POL TT15(1)(g):

i. Data must be transmitted to the Hawke's Bay Regional Council's telemetry system at least once in every 24 hour period;

ii. The data logger and telemetry unit shall record the volume and rate of take every 15 minutes. Each 15 minute interval shall be date and time stamped with the New Zealand standard time at the end of that interval. When a telemetry device is not operative for any reason, the water meter shall be read manually at daily intervals and reported to Council within 7 days;

iii. The telemetry device shall be operative 365 days of the year;

iv. On mobile pumps or take systems, water measuring devices, data loggers and telemetry components shall remain turned on during the irrigation season; and shall not be able to be made inoperable while the pump or take system is operating.

(b) Where the meter is read manually, it shall be read weekly and reported monthly to the Hawke's Bay Regional Council.

3. The method of measuring and reporting of water takes that are of a volume or nature that water meters cannot accommodate shall be consistent with the provisions of the Resource Management (Measurement and Reporting of Water Takes) Regulations 2010.

6.9 Tukituki River Catchment Rules

6.9.1 Land Use and Water Quality

Rule	Activity	Classification	Conditions/Standards/Terms	Matters for Control/Discretion
TT1 **Production land use** Refer to POLs TT1 to TT5	The use of production land in the Tukituki River catchment pursuant to s9(2) RMA.	Permitted	a. Where existing nitrogen losses increase[39] as a result of landuse change or farm management changes, the nitrogen leached from the land (modelled as a loss from the root zone using Overseer or an alternative model approved by Hawke's Bay Regional Council) shall not exceed the relevant Policy TT4(1)(e) benchmark leaching rate for the land: (i) by more than 10%; nor (ii) by more than 5 kg N/ha/yr. b. For properties exceeding 4 hectares in area the records specified in Schedule XXI shall be retained for each year (1 July to 30 June) from 1 July 2013 onwards to enable a Nutrient Budget to be prepared and those records shall be provided to the Hawke's Bay Regional Council upon request. In the absence of the records being retained, Nutrient Budget inputs will be determined in accordance with the methodology specified in Schedule XXI. c. For properties exceeding 4 hectares in area a Nutrient Budget[40], incorporating the modelling of whole of property nutrient losses (kg/ha/year) calculated using the annual records specified in Schedule XXI and the Overseer nutrient budget model (or an alternative model approved by Hawke's Bay Regional Council) must be prepared for the land prior to 1 July 2018 and be provided to the Hawke's Bay Regional Council. The Nutrient Budget shall be updated at three yearly intervals and be provided	

[39] An increase includes a single increase and cumulative increases over time.
[40] A Nutrient Budget has the same meaning as set out in POL TT4.

Rule	Activity	Classification	Conditions/Standards/Terms	Matters for Control/Discretion
			to the Hawke's Bay Regional Council. d. After 1 July 2020 the nitrogen leached from the land (modelled as a loss from the root zone using Overseer or an alternative model approved by Hawke's Bay Regional Council) shall not exceed industry good practice leaching rates for the land use and soil type; and the nitrogen conversion efficiency shall meet industry good practice for the land use and soil type.[41] e. For properties exceeding 4 hectares a Phosphorus Management Plan shall be prepared for the land and be provided to the Hawke's Bay Regional Council as follows: (i) in the Papanui and the Porangahau catchments as shown in Schedule XIV by 1 July 2017; (ii) in the Maharakeke catchment as shown in Schedule XIV by 1 July 2018; (iii) in the Tukipo, Kahahakuri and Upper Tukituki Corridor catchments as shown in Schedule XIV by 1 July 2020. f. Where more than 60% of land within a single paddock adjoining a water body has a slope of 15 degrees or less as illustrated in Schedule XX[42] all livestock shall be excluded from: (i) Any lake, wetland and permanently flowing river and their margins by 31 December 2017; (ii) Any intermittently flowing river[43] and its margin by 31 December 2022. g. Where more than 60% of land within a single paddock	

[41] Industry good practice leaching rates for the land use and soil type and industry good practice nitrogen conversion efficiencies will be determined by HBRC in consultation with primary sector industry groups and included in the Regional Resource Management Plan by way of Plan Change prior to 1 July 2018.

42 Schedule XX is based on slope classifications contained within the NZLRI and is at a coarse catchment scale. To determine compliance with Rule TT1 at a paddock scale, HBRC will use the highest resolution Digital Elevation Model or LIDAR image available to determine the proportion of slope by using standard triangulation methods.

[43] An intermittent river does not flow continuously but has a bed that is predominantly unvegetated and comprises sand, gravel, boulders or similar material.

Rule	Activity	Classification	Conditions/Standards/Terms	Matters for Control/Discretion
			land adjoining the water body has a slope of greater than 15 degrees as illustrated in Schedule XX[41], all livestock stocked at a rate of more than 18 stock units per hectare or greater on that land (other than sheep) shall be excluded from: (i) Any lake, wetland and any permanently flowing river and their margins by 31 December 2017; and (ii) Any intermittently flowing river and its margin 31 December 2022. h. Notwithstanding conditions (f) and (g), grazing of a permanently fenced riparian margin may occur for weed control purposes provided that: (i) The period of grazing does not exceed 7 days; (ii) The fenced riparian margin shall not be grazed more than once and only during the period 1 November to 30 April. i. Notwithstanding conditions (f) and (g), stock may continue to utilise managed stream crossing points (where stock are usually excluded from the surface water body but are actively herded across the surface water body by the farmer). j. Rivers that are permanently or intermittently flowing that are crossed by formed stock races shall be bridged or culverted by 30 June 2017. k. After 1 July 2018, nitrogen leached from the land shall not be demonstrated[44] to be causing or contributing to any measured exceedence of the Table 5.9.1B limits for the 95th percentile concentration of nitrate-nitrogen in any mainstem or tributary of a river or to any measured exceedence of the Table 5.9.2 groundwater quality limits for nitrate-nitrogen.	

[44] "Demonstrated" means as a result of monitoring and/or modelling undertaken by the Hawke's Bay Regional Council.

Rule	Activity	Classification	Conditions/Standards/Terms	Matters for Control/Discretion
			l. Contaminants leached from the land shall not be demonstrated to be causing or contributing to any breach of the Resource Management (National Environmental Standards for Human Drinking Water) Regulations 2007 or the guideline values or maximum acceptable values for determinands in the Drinking Water Standards of New Zealand 2008 for any registered drinking water supply takes. (Note: Hawke's Bay Regional Council is satisfied that this permitted activity rule will not cause or contribute to any such breach for any registered drinking water supply but Condition l. is included here for completeness.)	
TT2 **Production land use** Refer to POLs TT1 to TT5	The use of production land pursuant to s9(2) RMA within the Tukituki River catchment that does not comply with Rule TT1.	Restricted Discretionary		a. The actual or proposed nutrient loss in relation to: (i) Industry good practice nitrogen leaching rates having regard to POL TT4; (ii) The current surface water quality and the surface water quality limits in the catchment having regard to POL TT1; (iii) The current groundwater water quality and the groundwater water quality limits in the catchment having regard to POL TT2; (iv) Current estimates of catchment or water management zone loads of nitrogen and phosphorus having regard to POL TT4 and TT5. b. The adequacy of any proposed industry good practices and any associated Farm Environmental Management Plan designed to avoid, remedy or mitigate the effects of the activity having regard to POL TT6. c. The imposition of mitigation measures where stock are unable to be excluded from water as required by Rule TT1. d. The imposition of mitigation measures where the activity is likely to contribute to or cause a breach of the Drinking-Water Standards for New Zealand having regard to POL TT1 and POL TT2. e. Monitoring and reporting requirements having regard to POL TT15.

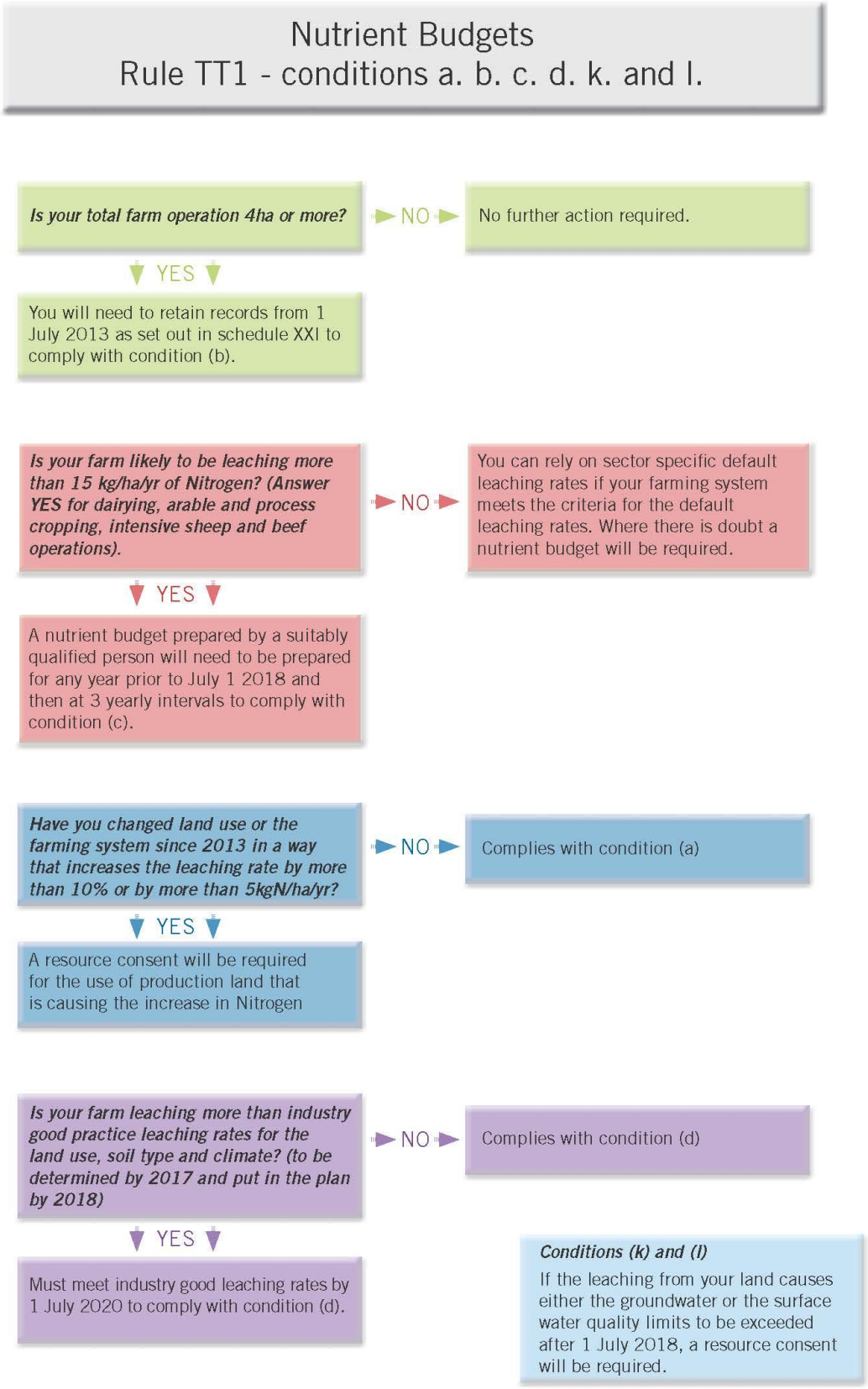
Rule	Activity	Classification	Conditions/Standards/Terms	Matters for Control/Discretion
				f. Duration of consent having regard to POL TT6(3). g. Review of consent conditions.

6.9.2 Takes

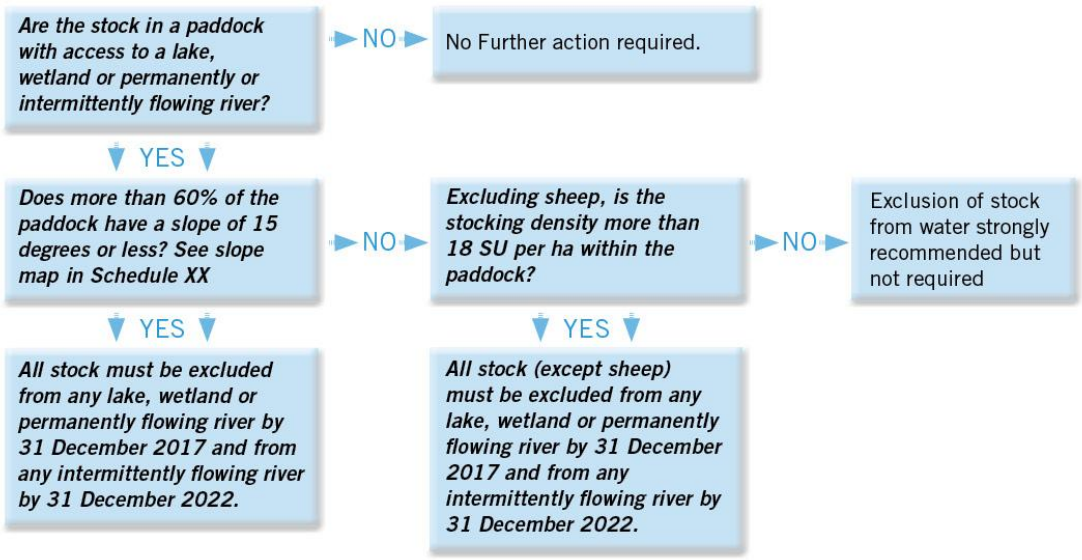
Rule	Activity	Classification	Conditions/Standards/Terms
TT3 Refer to POLs TT9 and TT15	The take and use of surface water or groundwater, including groundwater takes located outside of Groundwater Allocation Zones 1 to 3	Permitted	a. The take is for the purpose of filling agrichemical spray tanks for use on a property less than 10 hectares in size. b. The take is from an existing take point that is either: i. solely used for filling agrichemical spray tanks; or ii. part of an existing irrigation system but the spray filling off-take is situated upstream of any pump.
TT4 **Takes** Refer to POLs TT7 to TT15	The take and use of surface water or groundwater, including groundwater takes located outside of Groundwater Allocation Zones 1 to 3.	Discretionary	a. The take is not a groundwater take permitted under Rule 53 (Rule 53 continues to apply in the Tukituki River catchment). b. The take shall not be a new surface water take or a take associated with the operation of a Community Irrigation Scheme (in which latter case Rule 55 applies). c. The take is either: a. a new groundwater take outside the groundwater allocation zones; or b. the renewal of an existing groundwater take. d. The take shall not cause the Allocation Limits in Tables 5.9.4 and 5.9.5 or the High Flow Allocation Limits in Table 5.9.6 to be exceeded. e. The take, if it is not a high flow take enabled under POL TT10, shall be subject to the Minimum Flow Limits set in Table 5.9.3. f. The take, if it is a high flow take enabled under POL TT10, shall be subject to the High Flow Minimum Flow Limits set in Table 5.9.6.
TT5 **Takes** Refer to POLs TT7 to TT15	The take and use of surface water or groundwater that does not comply with Rule TT3 and TT4, other than takes for Community Irrigation Schemes under Rule 55.	Non-Complying	

EXPLANATORY FLOW CHARTS FOR RULE TT1

These flow charts are designed to assist farmers through the conditions of Rule TT1 to determine compliance with permitted activity Rule TT1. The flow charts contain information that is at an over view level and readers should refer to the rules to gain a complete understanding.


Nutrient Budgets
Rule TT1 - conditions a. b. c. d. k. and l.
Is your total farm operation 4ha or more?
NO
No further action required.
YES
You will need to retain records from 1 July 2013 as set out in schedule XXI to comply with condition (b).
Is your farm likely to be leaching more than 15 kg/ha/yr of Nitrogen? (Answer YES for dairying, arable and process cropping, intensive sheep and beef operations).
NO
You can rely on sector specific default leaching rates if your farming system meets the criteria for the default leaching rates. Where there is doubt a nutrient budget will be required.
YES
A nutrient budget prepared by a suitably qualified person will need to be prepared for any year prior to July 1 2018 and then at 3 yearly intervals to comply with condition (c).
Have you changed land use or the farming system since 2013 in a way that increases the leaching rate by more than 10% or by more than 5kgN/ha/yr?
NO
Complies with condition (a)
YES
A resource consent will be required for the use of production land that is causing the increase in Nitrogen
Is your farm leaching more than industry good practice leaching rates for the land use, soil type and climate? (to be determined by 2017 and put in the plan by 2018)
NO
Complies with condition (d)
YES
Must meet industry good leaching rates by 1 July 2020 to comply with condition (d).
Conditions (k) and (l)
If the leaching from your land causes either the groundwater or the surface water quality limits to be exceeded after 1 July 2018, a resource consent will be required.

Stock Exclusion
Rule TT1 - conditions f. g. h. i. and j.



Definition of intermittently flowing river

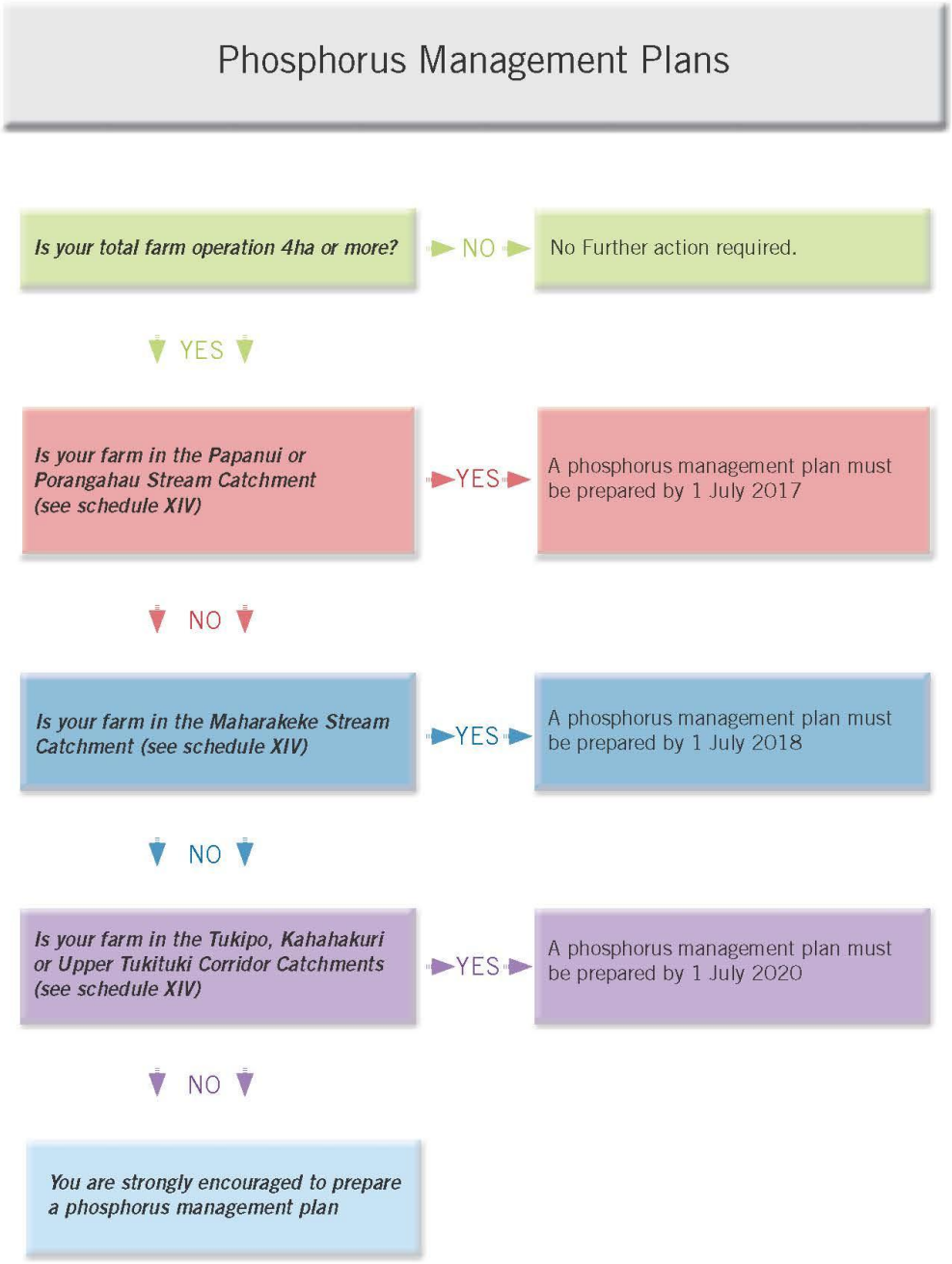
A river or stream that does not flow continuously and has a bed that is predominantly unvegetated and comprises sand, gravels, boulders or similar material

Stock crossings and other exceptions

Any stock race must be bridged or culverted by 30 June 2017

Managed movement of stock within and between paddocks that requires the crossing of a river or stream is allowed if it cannot reasonably be avoided.

Grazing stock in fenced riparian margins for weed control is allowed provided that the period of grazing does not exceed 7 days and only occurs once between November and April.


Phosphorus Management Plans
Is your total farm operation 4ha or more?
NO
No Further action required.
YES
Is your farm in the Papanui or Porangahau Stream Catchment (see schedule XIV)
YES
A phosphorus management plan must be prepared by 1 July 2017
NO
Is your farm in the Maharakeke Stream Catchment (see schedule XIV)
YES
A phosphorus management plan must be prepared by 1 July 2018
NO
Is your farm in the Tukipo, Kahahakuri or Upper Tukituki Corridor Catchments (see schedule XIV)
YES
A phosphorus management plan must be prepared by 1 July 2020
NO
You are strongly encouraged to prepare a phosphorus management plan

ADDITIONAL TERMS FOR THE GLOSSARY IN SECTION 9 OF THE REGIONAL RESOURCE MANAGEMENT PLAN

Allocation Limit (Tukituki)
The rate and volume of water available for abstraction from surface water and groundwater for out of stream use, as set out in Policy TT8 and TT10.

Average groundwater pumping rate
For the purpose of Policy TT11 and Table 5.9.7 the average ground pumping rate is based on the seasonal or annual volume averaged over 100 days or full year, whichever is applicable, assuming pumping occurs for 24 hours per day.

Community Irrigation Scheme
A water supply system that is capable of providing irrigation water to at least 5,000 hectares of production land.

DWSNZ
Drinking water standards for New Zealand (2005/ Revised ed. 2008).

Environmental State Indicator
The numerical value for a water quality parameter that defines the desired state in order to safeguard the life supporting capacity of the water body. .

Existing
For the purpose of Policies TT1 to TT15 and Rules TT1 to TT5, existing means as at the [date of notification]

Farm Environmental Management Plan
Means a whole of farm environmental management plan which addresses environmental risks associated with irrigation management, animal effluent management, fertiliser management, stock management and soil management and is prepared in accordance with the requirements listed in Schedule XXII.

Flow Management Site
Means a site on the river where minimum flow limits are set and monitored.

Ground Water Allocation Zone (Tukituki)
An area of the catchment as shown in Schedule XVII that has a defined allocation limit for groundwater abstraction set in Table 5.9.5

Level of Habitat Protection
In relation to Tukituki River catchment minimum flow limits, relates to the level of habitat protection as a percentage relative to the habitat available at the Mean Annual Low Flow.

High Flow Take
Means a water take that occurs from a river that is flowing in excess of its median flow under the provision of Policy TT10.

Industry Good Practice
Refers to any farm management practice, the use of technology or changes to farming systems that reduces the environmental impact of the use of production land on the environment and that is promoted by the relevant primary production sector as industry good practice.

Intermittently Flowing River
A river that does not flow continuously and has a bed that is predominantly unvegetated and comprises sand, gravel, boulders or similar material.

Limit
The derived numerical value for a water quality parameter that must not be exceeded. Limits apply where the existing water quality is better than the numerical value.

MALF
Means Mean Annual Low Flow of a river and the average of the annual low flows occurring over 7 consecutive days for the years where river flow records are available for a river

Management Entity
In relation to Policy TT12, a legally established entity with authority from a group of consent holders to manage temporary transfers of water between consent holders.

Maximum allowable in-stream water management zone loads (P)

MAZL
Means Maximum Allowable Zone Load which is the maximum amount of nutrient (in units of tonnes/year) that can be lost from production land within a Water Management Zone without breaching instream water quality concentration limits set for that nutrient . For phosphorus, it is the annual phosphorus load as measured in the river. For nitrogen it is the nitrogen leaching losses from the root zone of the soils farmed.

MERI
A Monitoring Evaluation Reporting and Improvement Plan prepared as part of the Tukituki Catchment Implementation Plan which outlines how the non-regulatory approaches in Change 6 (Tukituki Catchment) will be implemented.

NESDW
Means National Environmental Standard for Sources of Human Drinking Water 2007.

Nutrient Budget
A Nutrient Budget means either:

(a) a budget prepared in accordance with the "Code of Practice for Nutrient Management (with Emphasis on Fertiliser Use), 2007" published by the Fertiliser Association of New Zealand, and which is prepared or approved by a 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 information requested by the Hawke's Bay Regional Council shall be provided in an electronic format compatible with HBRC information systems and may include but shall not be limited to the following reports from Overseer or their equivalent if an alternative model is used: Nutrient Budget, Nitrogen, Phosphorus, Summary, Nitrogen Overview; or

(b) an auditable sector specific default nitrogen leaching rate derived from industry specific, statistically representative data for nitrogen leaching rates less than 15 kgN/ha/year.

Phosphorus Management Plan
Means a plan prepared generally in accordance with industry code of practices which identifies the inherent environmental risks on the property associated with phosphorus and sediment loss, the significance of those risks, and identifies management practices to be implemented to avoid or reduce the risks. The Phosphorus Management Plan includes a basic nutrient budget as described for Beef and Lamb New Zealand's Level 2 Land Environment Plan.

Overseer
Overseer is a nutrient budget model that calculates and estimates the nutrient flows in a productive farming system and estimates nutrient losses on a long term average basis (in units of kg/ha/year). It is owned and administered by the Ministry of Primary Industry, Fertiliser Association of New Zealand and AgResearch.

Periphyton
Is a complex mixture of algae and slimes that attach to submerged surfaces in rivers

Potable
Water that is suitable for human consumption.

Seasonal volume
Is the actual crop water requirement required over a crops growing season (including any crop rotation).

Surface Water Allocation Zone (Tukituki)
An area of the catchment as shown in Schedule XVI that has a defined allocation limit for surface water abstraction set in Table 5.9.4.

Target
The derived numerical value for a water quality parameter that is desired to be achieved over time. Targets apply where the existing water quality is worse than the numerical value.

Telemetry
Is a method of transmitting data electronically via wireless data transfer mechanisms, a telephone or computer network, optical link or other wired communications like phase line carriers.

TT
In reference to policy and rule titles means Tukituki and indicates that the policies and rules so referenced relate to the Tukituki Catchment only.

Water Management Zone
An area of the catchment as shown in Schedule XV that has defined surface water quality limits set out in Policy TT1 and Table 5.9.1A and 5.9.1B.

CONSEQUENTIAL AMENDMENTS TO CHAPTERS 5 AND 6

As a consequence of the new chapters 5.9 and 6.9, amendments have been made to the following parts of Chapter 5 and 6:

Chapter 5.4	Surface Water Quality	Tukituki River Catchment excluded in its entirety
Chapter 5.5	Surface Water Quantity	Tukituki River Catchment excluded in its entirety
Chapter 5.6	Groundwater Quality	Tukituki River Catchment excluded in its entirety
Chapter 5.7	Groundwater Quantity	
Chapter 6.2	Summary of Rules	Update of summary table
Chapter 6.6	Discharges to Land/Water	Specific amendments made

Amendments are shown in grey shading with deletions shown as ~~strikethrough~~.

5.4 Surface Water Quality

The provisions of Chapter 5.4 do not apply within the Tukituki River catchment.

OBJECTIVE

OBJ 40 The maintenance of the water quality of specific rivers in order that the existing species and natural character are sustained, while providing for resource availability for a variety of purposes, including groundwater recharge.

Refer section 2.2 of this Plan

Explanation and Reasons

5.4.1 Prior to this Plan being prepared, the HBRC had already established an approach of managing rivers, lakes and wetlands for the purposes of aquatic ecosystems in its former Regional Policy Statement and Regional Water Resources Plan. These documents had also signalled the need to manage water quality for the purpose of contact recreation where this was practicable and desirable. Objective 40 above continues this overall approach– it establishes that rivers, lakes and wetlands are to be managed for both aquatic ecosystems and contact recreation purposes, where appropriate. During the life of this Plan the Council will continue to work towards surface water management on a catchment by catchment basis. The goal of managing for contact recreation purposes does not pre-suppose that contact recreation will occur, but rather sets a guideline which is another stage in the overall attainment of better water quality. Those stretches of river near the coast which are influenced by the sea will have guidelines which reflect the water quality expectations of the coastal marine areas, as set out in the Regional Coastal Plan.

POLICIES

POL 71 ENVIRONMENTAL GUIDELINES - SURFACE WATER QUALITY

5.4.2 To manage the effects of activities affecting the quality of water in rivers, lakes and wetlands in accordance with the environmental guidelines set out in Tables 7 and 8[16].

Table 7. Environmental Guidelines – Surface Water Quality
Part I - Guidelines that apply across the entire Hawke's Bay region

Issue	Guideline
1. Temperature	The temperature of the water should be suitable for sustaining the aquatic habitat.
2. Dissolved oxygen	The concentration of dissolved oxygen should exceed 80% of saturation concentration.
3. Ammoniacal nitrogen	The concentration of ammoniacal ($N\text{-}NH_4^+$) should not exceed 0.1 mg/l.
4.Soluable reactive phosphorus	The concentration of soluble reactive phosphorus should not exceed 0.015 mg/l.
5. Clarity	In areas used for contact recreation, the horizontal sighting range of a 200 mm black disk should exceed 1.6 m.

These guidelines apply after reasonable mixing and disregarding the effect of any natural perturbations that may affect the water body, as set out in Policy 72.

[16] Comparison of guidelines with existing water quality – Schedule III gives detailed explanation and reasons for the environmental guidelines for surface water quality, and the annual State of the Environment Update Report (HBRC) provides information on existing water quality.

Table 8. Environmental Guidelines – Surface Water Quality
Part II –Guidelines that Apply to Specific Catchments

Catchment Area	Faecal Coliforms (cfu/100 ml)	Suspended Solids (mg/l)
Aropaoanui River	200	50
Clive Rivers and tributaries	200	10
Esk River	200	50
Ikanui Stream	200	50
Kopuawhara Stream	200	50
Mangakuri Stream	200	50
Maraetotara River	200	50
Mohaka River	50	10
Ngaruroro River upstream of Fernhill Bridge	50	10
Ngaruroro River between Fernhill Bridge and Expressway Bridge	100	25
Ngaruroro River downstream of the Expressway Bridge	150	25
Opoutama Stream	200	50
Papanui Stream	150	10
Porangahau River	200	50
Puhokio Stream	200	50
Taharua Stream	50	10
~~Tukituki River and tributaries upstream of SH50~~	~~50~~	~~10~~
~~Tukituki River and tributaries between SH50 and Tamumu Bridge~~	~~200~~	~~10~~
~~Tukituki River downstream of Tamumu Bridge~~	~~100~~	~~10~~
Tutaekuri River upstream of Redclyffe Bridge	50	10
Tutaekuri River between Redclyffe Bridge and SH50	100	25
Tutaekuri River downstream of the Expressway Bridge	150	25
Waingonoro Stream	200	50
Waipatiki Stream	200	50
Waipuka Stream	200	50
Wairoa River and tributaries upstream of Frasertown	100	25
Wairoa River at and downstream of Frasertown	200	25

These guidelines apply after reasonable mixing and disregarding the effect of any natural perturbations that may affect the water body, as set out in Policy 72.

* The figures in Table 8 represent concentrations of contaminants in the water body that should not be exceeded after reasonable mixing.

Explanation and Reasons

5.4.3 Policy 71 sets out the surface water quality guidelines. In most cases, existing water quality reaches the levels set. However in some cases, such as faecal coliforms, there is a need for improvement. Overall, the present water quality of rivers and lakes throughout the region is good. Indeed, some water quality parameters are at a level throughout the region that limits the onset of problems, e.g. soluble reactive phosphorus is at a sufficiently low level that it restricts the undesirable growth of green algal slimes.

5.4.4 The water quality guidelines set out in Policy 71 are likely to be refined in future. The Ministry for the Environment is currently undertaking a substantial amount of work that is likely to influence the resource management approaches of regional councils in future. In particular, the Ministry is developing a suite of environmental indicators, and a methodology classifying specific reaches of catchments for different management purposes. As this information becomes available, the HBRC is likely to build upon, and refine, its present overall direction for water quality management (rather than start afresh). This is likely to mean that, in future, more detailed water management objectives and standards will be developed on a reach-by-reach basis for surface water resources in the region.

5.4.5 The relevance of the specific water quality parameters chosen in Policy 71 is as follows (note that further explanation and reasons of the parameters used is provided in Schedule III while the State of the Environment Report and Annual Updates provide information on existing water quality for comparative purposes):

(a) **Temperature –** Temperature changes have a significant effect on the functioning of aquatic ecosystems. Particular increases in temperature have adverse effects.

(b) **Dissolved oxygen –** An adequate concentration of dissolved oxygen is critical for sustaining aquatic life. An inadequate level is akin to 'suffocating' the aquatic ecosystem.

(c) **Ammoniacal nitrogen –** Ammoniacal nitrogen is toxic to aquatic fauna and, in sufficient concentrations, can also be linked to adverse instream pH and hardness. High concentrations are generally as a result of animal faecal material and decomposing organic matter being carried into waterways.

(d) **Soluble reactive phosphorus –** The presence of high concentrations of soluble reactive phosphorus can result in undesirable biological growths. It can also indicate that land use practices may not be appropriate, e.g. fertiliser application, grazing or cultivation of river margins. Soluble reactive phosphorus is naturally low in waterways in Hawke's Bay – maintaining these low levels will assist in the maintenance of instream habitat.

(e) **Faecal coliforms –** Faecal coliform bacteria are a general indicator of mammalian contamination, including human sewage. In sufficient numbers, faecal coliform bacteria denote a significant health risk. Achieving low levels is thus critical for contact recreation purposes. High numbers can also restrict macroinvertebrate fauna, and increase the abundance of benthic slimes and macro flora.

(f) **Suspended solids and clarity –** The presence of high levels of suspended solids or turbidity can inhibit the abundance of fish species, and reduce the diversity and abundance of instream life in general and restrict other uses. Poor clarity is likely to restrict contact recreation use.

POL 72 IMPLEMENTATION OF ENVIRONMENTAL GUIDELINES - SURFACE WATER QUALITY

5.4.6 To implement the environmental guidelines for surface water quality predominantly in the process of making decisions on resource consents in accordance with section 104 (1)(b) of the RMA, and in accordance with the following approach:

(a) **After reasonable mixing -** The environmental guidelines apply to surface water bodies after reasonable mixing of contaminants[17], and disregarding the effect of any natural perturbations that may affect the water body. The exception is where water diverted or discharged into water from a hydro-electric power scheme entrains sediment between the point of discharge and the point of reasonable mixing, causing a breach of the suspended sediments guidelines c (i) and (ii) below. In this case, the guidelines may apply at the point of discharge, disregarding the effect of any natural perturbations that may affect the water body.

(b) **At or below median flows or levels for all guidelines except suspended solids** – All environmental guidelines, except those for suspended solids, apply to flowing surface water bodies when the flow of water is at or less than the median flow, or for non-flowing water bodies, the level of water is at or less than the median level.

(c) **At all flows for suspended solids –** The guidelines for suspended solids apply as follows:

(i) At times when the suspended solids concentration is less than the specified guideline for a particular water body and location, an activity should not cause, or contribute to, a breach of the

[17] For the purposes of this Regional Plan, **"reasonable mixing in surface water"** of contaminants in surface water will generally be considered to have occurred as follows:
a) In relation to flowing surface water bodies, at whichever of the following is the least:
(i) a distance 200 metres downstream of the point of discharge
(ii) a distance equal to seven times the bed width of the surface water body, but which shall be not less than 50 metres, or
(iii) the distance downstream at which mixing of contaminants has occurred across the full width of the surface water body, but which shall not be less than 50 metres.
b) In relation to lakes, at a distance 15 metres from the point of discharge.
Alternatively, for activities that are subject to resource consents, "reasonable mixing" may be determined on a case by case basis through the resource consent process.

specified guideline. In no case should an activity cause more than a doubling of the suspended solids concentration or turbidity of the receiving water body.

(ii) At times when the suspended solids concentration is equal to or greater than the specified guideline, an individual activity should not cause the concentration of suspended solids or the turbidity in any river or lake to increase by more than 10%, as determined on a case by case basis.

[Note that the HBRC recognises that some resource users prefer to measure clarity, rather than concentrations of suspended solids or turbidity. While there is not a direct relationship between suspended solids and clarity that can be applied across the region, the HBRC is happy to work with any such resource users to establish allowable changes in clarity corresponding to the suspended solids limits where this is required.]

(d) **Existing good water quality –** Where existing water quality is better than the guidelines, no more than minor degradation of water quality will be allowed.

(e) **Improvement of poor water quality** – Where existing water quality is poorer than the guidelines, the following approach will be adopted:

(i) **Regulated activities –** Where activities that are regulated by way of resource consents (e.g. discharges of contaminants into water) are the predominant cause of poor water quality, improvements will be sought at the time of granting, reviewing or renewing the consent while having regard to the following:

- the degree to which the activity adversely affects aquatic ecosystems and contact recreation.
- the extent to which the activity causes the poor water quality relative to other activities
- for existing activities, the need to allow time to achieve the required improvements.

Where activities that are regulated by way of resource consents are not the predominant cause of degraded water quality, conditions will be imposed on such consents to avoid further degradation of water quality unless the HBRC is satisfied that:

- the activity will not cause any significant adverse effects on aquatic ecosystems and contact recreation.
- exceptional circumstances justify allowing further degradation, or
- in the case of discharges, the discharge is of a temporary nature, or is associated with necessary maintenance work.

(ii) **Unregulated activities –** Where activities that are unregulated are the predominant cause of poor water quality, non-regulatory methods (as set out in Chapter 4) will be used as the primary means for achieving an improvement in water quality, in particular:

- the provision of financial incentives to facilitate improved land management practices, including the retirement of riparian margins, or to enhance wetlands
- the provision of education and co-ordination.

Where no improvement or where further degradation is evident over time as a result of unregulated activities, the HBRC will consider the need for regulation of these activities.

(f) **Recognition of variables –** Consideration of the environmental guidelines will take into account the measurement uncertainties associated with variables such as location, flows, seasonal variation and climatic events.

(g) **Temporary / maintenance activities** (including those required for the management of a commercial forest) **–** Consideration of the environmental guidelines in relation to discharges will take into account the degree to which a discharge is of a temporary nature, or is associated with maintenance work.

Explanation and Reasons

5.4.7 Policy 72 sets out how the surface water quality guidelines are to be implemented. It specifies that the guidelines are to be implemented largely through resource consent processes, and then sets out the manner in which the guidelines will be used. This policy makes it clear that, where existing water quality is better than the guidelines, the present water quality should be maintained. By contrast, where existing water quality is worse than the guidelines, the Council will seek improvements by way of resource consents or non-regulatory methods as appropriate.

POL 72A DISCHARGE PERMITS – Matters for consideration

5.4.7A When considering any application for a discharge the consent authority must have regard to the following matters:

(a) the extent to which the discharge would avoid contamination that will have an adverse effect on the life-supporting capacity of fresh water including on any ecosystem associated with fresh water and

(b) the extent to which it is feasible and dependable that any more than minor adverse effect on fresh water, and on any ecosystem associated with fresh water, resulting from the discharge would be avoided.[45]

Explanation and Reasons

5.8.4B Policy 72A was inserted in accordance with the direction stated in Policy A4 of the National Policy Statement for Freshwater Management 2011. HBRC gave public notice of this amendment on 1 July 2011. The amendment came into effect from that date.

ANTICIPATED ENVIRONMENTAL RESULTS

Anticipated Environmental Result	Indicator	Data Source
Surface water bodies suitable for sustaining aquatic ecosystems	1. Temperature not changed by more than 3°C, nor raised above 25°C. 2. Dissolved oxygen not falling below guideline levels. 3. Ammoniacal nitrogen levels not exceeding guideline values. 4. Soluble reactive phosphorus values not exceeding guideline values. 5. Diversity and quantities of fish species or indigenous invertebrates is maintained.	Council Water Quality monitoring programme Annual SER monitoring

[45] NOTE 1: This policy applies to the following discharges (including a diffuse discharge by any person or animal):
(a) a new discharge or
(b) a change or increase in any discharge –
of any contaminant into fresh water, or onto or into land in circumstances that may result in that contaminant (or, as a result of any natural process from the discharge of that contaminant, any other contaminant) entering fresh water.
NOTE 2: This policy does not apply to any application for consent first lodged before the National Policy Statement for Freshwater Management takes effect on 1 July 2011.

5.5 Surface Water Quantity

The provisions of Chapter 5.5 do not apply within the Tukituki River catchment.

OBJECTIVE

OBJ 41 The maintenance of the water quantity of specific rivers in order that the existing aquatic species and the natural character[18] are sustained, while providing for resource availability for a variety of purposes, including groundwater recharge.

Refer section 2.2 of this Plan

POL 73 ENVIRONMENTAL GUIDELINES - SURFACE WATER QUANTITY

(a) To sustain aquatic ecosystems by establishing a minimum flow in a river as that level which will maintain the existing ecosystem.

(b) On rivers (or water management zones) where minimum flows have been established, all takes for which a resource consent is required will be required to cease when the river is flowing at or below the minimum flow. Except that where the taking has, as a primary purpose, the provision of drinking water to people or animals taking could be restricted to the level necessary to maintain human or animal welfare.

(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

(d) To sustain the natural character of the surface water body when determining the minimum flows and allocatable volumes for surface water bodies in Table 9.

Explanation and Reasons

5.5.1 Policy 73 recognises that Hawke's Bay is prone to extended dry periods when river flows can decrease dramatically. During these periods it is important to ensure, as far as possible, that aquatic ecosystems are not placed under additional stress over and above that which occurs naturally. In addition, the uses of water provided for as of right by the RMA (domestic use, stock water and fire fighting) need to be safeguarded.

POL 74 IMPLEMENTATION OF ENVIRONMENTAL GUIDELINES - SURFACE WATER QUANTITY

(a) **Resource Allocation**: to define the allocatable volume as being the difference between the summer 7-day Q95 and the minimum flow

(b) To implement the environmental guidelines for surface water quantity predominantly in the process of making decisions on **resource consents** in accordance with section 104 (1)(b) of the RMA, through Table 9.

[18] For the purposes of Section 5.5 **"natural character"** includes a range of qualities and features, which have been created and sustained by nature as distinct from those which have been constructed by people. The degree or level of natural character within an area depends to an extent to which natural elements, patterns and processes have occurred and the nature and extent of modifications to the natural environment.

Table 9. Minimum Flow and Allocatable Volumes for Specified Rivers

River name	Minimum Flow Site Name	Minimum Flow (l/s)	Allocatable Volume (m^3/week)	Map Reference
Awanui Stream	At The Flume	120	0	V21:357613
Awanui Stream	At Paki Paki Culvert	35	0	V21:351608
Esk River	At Shingle Works	1,400	355,018	V20:432945
Esk River	At SH2	1,100		V20:438939
Irongate Stream	At Clarks Weir	100	0	V21:367666
~~Kahahakuri Stream~~	~~At Onga Onga Road Bridge~~	~~200~~	~~17,250~~	~~U22:096357~~
Karamu River	At Floodgates	1,100	18,023	V21:427708
Karewarewa River	At Turamoe Road	75	-	V21:341622
Louisa Stream	At Te Aute Road	30	0	V21:410625
Maharakeke Stream	At Station Road	140	0	U23:041255
~~Makaretu Stream~~	~~At Watson Reach~~	~~170~~	~~53,827~~	~~U23:924270~~
Mangateretere Stream	At Napier Road	100	0	V21:438659
Maraekakaho River	At Taits Road	100	5,443	V21:170668
Maraetotara River	At Te Awanga Bridge	220	30,971	W21:520661
Ngaruroro River	At Fernhill Bridge	2,400	956,189	V21:330729
Nuhaka River	At Valley Road	80	41,731	X19:225329
Ongaru Drain	Wenley Road	5	0	V21:234653
~~Papanui Stream~~	~~At Middle Road~~	~~45~~	~~0~~	~~V22:278433~~
~~Porangahau Stream~~	~~At Oruawharo Road~~	~~50~~	~~-~~	~~U23:977259~~
Pouhokio Stream	At Allens Bridge	80	-	V22:498441
Poukawa Inflow	Site No. 1 (d/s dam)	10	0	V22:282504
Poukawa Inflow	Site No. 1a (u/s dam)	10	0	V22:285502
Poukawa Inflow	Site No. 6	3	0	V22:266478
Poukawa Stream	At Douglas Road	20	0	V22:298533
Raupare Stream	At Ormond Road	300	83,844	V21:398713
Te Waikaha Stream	At Mutiny Road	25	-	V22:361572
Trib. of Kauhauroa Stream	(Taylors)	5	0	X19:970397
~~Tukipo Stream~~	~~At SH 50~~	~~150~~	~~0~~	~~U22:948324~~
~~Tukituki River~~	~~At Red Bridge~~	~~3,500~~	~~1,407,751~~	~~V22:466581~~
~~Tukituki River~~	~~At Tapairu Road~~	~~1,900~~	~~492,307~~	~~V22:183312~~
Tutaekuri River	At Puketapu	2,000	928,972	V21:357812
Tutaekuri-Waimate	At Goods Bridge	1,200	367,114	V21:384751
Waimaunu Stream	At Duncans	10	15,304	X19:229300
~~Waipawa River~~	~~At Waipawa (SH2)~~	~~2,300~~	~~342,317~~	~~V22:163337~~

Explanation and Reasons

5.5.2 Objective 41 recognises the need to manage specific rivers for a range of in-stream and out of stream values and uses. It provides guidance on surface water management where there is potential conflict between uses of the water. The requirement is that surface water quantity is maintained to the extent that existing species, and natural character (excluding riparian vegetation in this context) are sustained, while providing for out of stream uses of the water including the recharge of aquifers.

5.5.3 Policy 74 recognises that Hawke's Bay is prone to extended dry periods when river flows can decrease dramatically. During these periods it is important to ensure, as far as possible, that aquatic ecosystems are not placed under additional stress over and above that which occurs naturally. In addition, the uses of water provided for as of right by the RMA (domestic use, stock water and fire fighting) need to be safeguarded.

5.5.4 The criteria for setting minimum flows are based on the following:

(a) identified or estimated habitat requirements for a range of species which currently exist in the river.

(b) the need to maintain water quality at low flows

(c) the need to meet recreational requirements

(d) Māori cultural and spiritual values

(e) the application of consistent methodology when setting and reviewing minimum flows

(f) the need to adequately provide for the recharge of groundwater

5.5.5 Established minimum flows may be altered by Plan Change on the basis of new information and/or a review of the criteria in relation to the specific river or stream.

5.5.6 In order to determine the maximum amount of water that could be sustainably allocated from a river the HBRC has selected the 7-day average flow that is exceeded 95% of the time over the summer period November-April as the key statistic. This statistic (the 7-day Q95) was selected because:

(a) It takes account of the natural availability of water within rivers.

(b) The November–April period is both the period of lowest flows and the time of greatest water demand in Hawke's Bay.

(c) The seven day averaged flow smooths out short-term variations that can skew low flow estimates.

(d) When a river is fully allocated and fully used the river should not drop below its minimum flow for more than 5% of the summer low flow period.

POL 74A WATER PERMITS – Matters for consideration

5.8.4A When considering any application the consent authority must have regard to the following matters:

(a) the extent to which the change would adversely affect safeguarding the life-supporting capacity of fresh water and of any associated ecosystem and

(b) the extent to which it is feasible and dependable that any adverse effect on the life-supporting capacity of fresh water and of any associated ecosystem resulting from the change would be avoided.[46]

Explanation and Reasons

5.8.4B Policy 80A was inserted in accordance with the direction stated in Policy B7 of the National Policy Statement for Freshwater Management 2011. HBRC gave public notice of this amendment on 1 July 2011. The amendment came into effect from that date.

[46] NOTE 1: This policy applies to:
(a) any new activity and
(b) any change in the character, intensity or scale of any established activity –
that involves any taking, using, damming or diverting of fresh water or draining of any wetland which is likely to result in any more than minor adverse change in the natural variability of flows or level of any fresh water, compared to that which immediately preceded the commencement of the new activity or the change in the established activity (or in the case of a change in an intermittent or seasonal activity, compared to that on the last occasion on which the activity was carried out).

NOTE 2: This policy does not apply to any application for consent first lodged before the National Policy Statement for Freshwater Management takes effect on 1 July 2011.

ANTICIPATED ENVIRONMENTAL RESULTS

Anticipated Environmental Result	Indicator	Data Source
The minimum flow is established and maintained at levels that provide for the sustaining of aquatic ecosystems and natural character in Hawke's Bay rivers	Measurement of river flow at minimum flow sites	Minimum flow monitoring and analysis
The maintenance of surface water quantity (other than by natural events) at a level which sustains the aquatic ecosystems in the relevant surface water bodies	Physical and biological parameters	Council SER monitoring

5.6 Groundwater Quality

The provisions of Chapter 5.6 do not apply within the Tukituki River catchment.

OBJECTIVES

OBJ 42 No degradation of existing groundwater quality in aquifers in the Heretaunga Plains ~~and Ruataniwha Plains~~ aquifer system~~s~~.

OBJ 43 The maintenance or enhancement of groundwater quality in unconfined or semi-confined productive aquifers[19] in order that it is suitable for human consumption and irrigation without treatment, or after treatment where this is necessary because of the natural water quality.

Refer section 2.2 of this Plan

POLICIES

POL 75 ENVIRONMENTAL GUIDELINES - GROUNDWATER QUALITY

5.6.1 Other than in the productive aquifer systems in the Tukituki River catchment, to manage the effects of activities affecting the quality of groundwater in accordance with the environmental guidelines set out in Table 10.

Table 10. Environmental Guidelines – Groundwater Quality

Issue	Guideline
CONFINED, PRODUCTIVE AQUIFERS IN THE HERETAUNGA PLAINS ~~AND RUATANIWHA PLAINS~~ AQUIFER SYSTEMS (as shown in Schedule IV)	
1. No degradation	There should be no degradation of existing water quality.
OTHER PRODUCTIVE AQUIFERS	
1. Human consumption	The quality of groundwater should meet the "Drinking Water Quality Standards for New Zealand" (Ministry of Health, 1995) without treatment, or after treatment where this is necessary because of the natural water quality
2. Irrigation	The quality of groundwater should meet the guidelines for irrigation water contained in the "Australian Water Quality Guidelines for Fresh and Marine Waters" (Australian and New Zealand Environment and Conservation Council, 1998) without treatment, or after filtration where this is necessary because of the natural water quality.

Explanation and Reasons

[19] For the purposes of this Plan a **"productive aquifer"** means an aquifer that has a sufficient quantity, quality and flow of water that it can be used for water supply purposes.

5.6.2 Policy 75 recognises the very high quality of groundwater in confined, productive aquifers in the Heretaunga Plains ~~and Ruataniwha Plains~~ aquifer systems, and the strategic importance of these groundwater resources to the region. It therefore establishes a regime of not allowing any degradation of the quality of these aquifers. Groundwater in the Tukituki River catchment (including the Ruataniwha Plains) is managed under chapter 5.9.

5.6.3 For other productive aquifers, the objectives and policies continue the approach established in the former Proposed Regional Water Resources Plan, of managing the water within these aquifers for the purposes of human consumption and irrigation. This may allow for some limited degradation of groundwater quality, provided the guidelines for human consumption and irrigation are met.

POL 76 IMPLEMENTATION OF ENVIRONMENTAL GUIDELINES – GROUNDWATER QUALITY

5.6.4 To implement the environmental guidelines for groundwater quality set out in Policy 75 predominantly in the following manner:

(a) **Resource consents –** The environmental guidelines will primarily be used in the process of making decisions on resource consents, in accordance with section 104 (1)(b) of the RMA.

(b) **Regional rules –** The environmental guidelines have also been incorporated in conditions, standards and terms in the rules set out in Chapter 6 of this Plan as appropriate.

And in accordance with the following approach:

(c) **After reasonable mixing -** The environmental guidelines will apply after reasonable mixing[20] of contaminants, and disregarding the effect of any natural perturbations that may affect the water body.

(d) **Heretaunga ~~& Ruataniwha~~ Plains confined aquifers –** To not permit any activity that is likely to cause any degradation of groundwater quality in confined productive aquifers in the Heretaunga Plains ~~and Ruataniwha Plains~~ aquifer systems. This means that activities involving the discharge of contaminants over the recharge areas will be regulated.

(e) **Other productive aquifers with good water quality -** For other productive aquifers where the existing groundwater quality is suitable for human consumption and irrigation (without treatment, or after filtration where this is necessary because of the natural water quality), to ensure that the groundwater quality remains within these guidelines.

(f) **Other productive aquifers with poor water quality –** Where existing water quality is poorer than the guidelines for "other productive aquifers", the following approach will be adopted:

(i) **Regulated activities –** Where activities that are regulated by way of resource consents (e.g. discharges of contaminants onto land) are the predominant cause of poor water quality, improvements will be sought at the time of granting, review or renewal of consent while having regard to the following:

- the extent to which the activity causes the poor water quality relative to other activities
- for existing activities, the need to allow time to achieve the required improvements.

Where activities that are regulated by way of resource consents are not the predominant cause of degraded water quality, conditions will be imposed on such consents to avoid further degradation of water quality unless the HBRC is satisfied that:

- exceptional circumstances justify allowing further degradation, or

[20] For the purposes of this Regional Plan, **"reasonable mixing"** of contaminants in groundwater is considered to have occurred at whichever of the following is the lesser:
a) a distance 100 metres from the point of discharge, or
b) the boundary of the subject property.
Alternatively, for activities that are subject to resource consents, "reasonable mixing" may be determined on a case by case basis through the resource consent process.

- in the case of discharges, the discharge is of a temporary nature, or is associated with necessary maintenance work.

(ii) **Unregulated activities –** Where activities that are unregulated are the predominant cause of poor water quality, non-regulatory methods (as set out in Chapter 4) will be used as the primary means for achieving an improvement in water quality, in particular the provision of education and co-ordination.

Where no improvement or where further degradation is evident over time as a result of unregulated activities, the HBRC will consider the need for regulation of these activities.

(g) **Interconnections between aquifers and other water bodies –** Aquifers (including unconfined, unproductive aquifers) that have hydraulic connections with other aquifers or surface water bodies will be managed in a manner which avoids a breach of the environmental guidelines for those other water bodies that are hydraulically connected.

Explanation and Reasons

5.6.5 Policy 76 sets out how the guidelines for groundwater quality will be implemented. It specifies that the guidelines have been applied through regional rules, and will be used in resource consent processes. It then sets out the manner in which the guidelines will be applied.

POL 76A DISCHARGE PERMITS – Matters for consideration in catchments other than the Tukituki River catchment

5.6.5A When considering any application for a discharge the consent authority must have regard to the following matters:

(a) the extent to which the discharge would avoid contamination that will have an adverse effect on the life-supporting capacity of fresh water including on any ecosystem associated with fresh water and

(b) the extent to which it is feasible and dependable that any more than minor adverse effect on fresh water, and on any ecosystem associated with fresh water, resulting from the discharge would be avoided.[47]

Explanation and Reasons

5.8.4B Policy 76A was inserted in accordance with the direction stated in Policy A4 of the National Policy Statement for Freshwater Management 2011. HBRC gave public notice of this amendment on 1 July 2011. The amendment came into effect from that date.

ANTICIPATED ENVIRONMENTAL RESULTS

Anticipated Environmental Result	Indicator	Data Source
No degradation of existing groundwater quality in confined productive aquifers	Nitrate levels Pesticides and herbicides	Ministry of Health Council SER monitoring
Groundwater quality in productive aquifers which meets the "Drinking Water Quality Standards for New Zealand" (MoH, 1995)	Nitrate levels Pesticides and herbicides	Ministry of Health Council SER monitoring
Groundwater quality in productive aquifers which meets irrigation guidelines contained in the "Australian Water Quality Guidelines for Fresh and Marine Waters" (Australian and NZ Environment and Conservation Council, 1998)	Nitrate levels Pesticides and herbicides	Ministry of Health Council SER monitoring

[47] NOTE 1: This policy applies to the following discharges (including a diffuse discharge by any person or animal):
(a) a new discharge or
(b) a change or increase in any discharge –
of any contaminant into fresh water, or onto or into land in circumstances that may result in that contaminant (or, as a result of any natural process from the discharge of that contaminant, any other contaminant) entering fresh water.
NOTE 2: This policy does not apply to any application for consent first lodged before the National Policy Statement for Freshwater Management takes effect on 1 July 2011.

5.7 Groundwater Quantity

OBJECTIVE

OBJ 44 The maintenance of a sustainable groundwater resource.

Refer section 2.2 of this Plan

POLICIES

POL 77 ENVIRONMENTAL GUIDELINES - GROUNDWATER QUANTITY

(a) To manage takes of groundwater to ensure abstraction does not exceed the rate of recharge.

(b) To manage the available groundwater resource to ensure supplies of good quality groundwater.

(c) To manage the groundwater resource in such a manner that existing efficient groundwater takes[21] are not disadvantaged by new takes.

(d) To manage takes of groundwater to ensure abstraction does not have an adverse effect on rivers, lakes, springs, or wetlands.

5.7.1 The guidelines to achieve this policy are set out in Table 11.

Table 11. Environmental Guidelines – Groundwater Quantity
Guidelines that apply across the entire Hawke's Bay region

Issue	Guideline
1.Demand	The safe yield or groundwater allocation limit identified for an aquifer should not be exceeded.
2. Effects of takes on water quality	Takes should not contribute to the intrusion of salt water into fresh water aquifers.
3. Effects of takes on levels of rivers, lakes, springs and wetlands	Other than in the Tukituki River catchment takes should not cause a reduction in the flow of rivers, levels of springs or lakes or ecologically significant wetlands. Takes in the Tukituki River catchment are managed under POL TT11.
4. Effects of new takes on existing authorised users	The take should not adversely impact on existing efficient groundwater or surface water takes unless written approval from affected persons is obtained. .

Explanation and Reasons

5.7.2 Policy 77 recognises that groundwater is a critical resource in Hawke's Bay, and in many areas is the main source of water. It is therefore necessary to ensure that the resource is managed in a sustainable manner to accommodate a variety of needs. It is also important to recognise that demand for the resource is high across a variety of sectors, in particular horticulture and agriculture. It is critical that there is a degree of protection for existing resource consent holders and permitted users whose takes are efficient, from adverse effects of new or proposed takes.

[21] For the purposes of this Plan **"efficient taking"** of groundwater means a bore which penetrates the aquifer from which water is being drawn at a depth sufficient to enable water to be drawn all year (i.e. the bore depth is below the range of seasonal fluctuations in groundwater level), with the bore being adequately maintained, of sufficient diameter and screened to minimise drawdown, with a pump capable of drawing water from the base of the bore to the land surface.

POL 78 IMPLEMENTATION OF ENVIRONMENTAL GUIDELINES – GROUNDWATER QUANTITY

5.7.3 To implement the environmental guidelines for groundwater quantity set out in Policy 77 predominantly in the following manner:

(a) **Regional rules –** The environmental guidelines have been incorporated in conditions, standards and terms in the rules set out in Chapter 6 of this Plan, and to guide the level of regulation, as appropriate. In particular minor takes and uses of groundwater have been permitted provided adverse effects are managed in accordance with the environmental guidelines.

(b) **Resource consents –** The environmental guidelines will also be used in the process of making decisions on resource consents, in accordance with section 104 (1)(b) of the RMA.

Explanation and Reasons

5.7.4 Policy 78 establishes how the environmental guidelines for groundwater quantity will be implemented. They will be used in rules, and in the resource consent process.

POL 78A WATER PERMITS – Matters for consideration in catchments other than the Tukituki River catchment

5.8.4A When considering any application the consent authority must have regard to the following matters:

(a) the extent to which the change would adversely affect safeguarding the life-supporting capacity of fresh water and of any associated ecosystem and

(b) the extent to which it is feasible and dependable that any adverse effect on the life-supporting capacity of fresh water and of any associated ecosystem resulting from the change would be avoided.[48]

Explanation and Reasons

5.8.4B Policy 80A was inserted in accordance with the direction stated in Policy B7 of the National Policy Statement for Freshwater Management 2011. HBRC gave public notice of this amendment on 1 July 2011. The amendment came into effect from that date.

ANTICIPATED ENVIRONMENTAL RESULTS

Anticipated Environmental Result	Indicator	Data Source
Avoid any significant adverse effects of water takes on the long term quantity of groundwater in the regions aquifers	Water level trends	Council SER monitoring
The availability of groundwater for use without it being taken at a rate that depletes the resource beyond a sustainable level	Water level trends	Council SER monitoring
Avoid or remedy significant adverse effects of groundwater takes on rivers, lakes, ecologically significant wetlands and springs	Flow or level data	Council surface water monitoring programme

[48] NOTE 1: This policy applies to:
(a) any new activity and
(b) any change in the character, intensity or scale of any established activity –
that involves any taking, using, damming or diverting of fresh water or draining of any wetland which is likely to result in any more than minor adverse change in the natural variability of flows or level of any fresh water, compared to that which immediately preceded the commencement of the new activity or the change in the established activity (or in the case of a change in an intermittent or seasonal activity, compared to that on the last occasion on which the activity was carried out).

NOTE 2: This policy does not apply to any application for consent first lodged before the National Policy Statement for Freshwater Management takes effect on 1 July 2011.

6.2 Summary of Regional Rules

6.2.1 Table 13 (below) provides a summary of the rules for easy reference.

6.2.2 It is important to note that a "permitted activity" as described in the summary in Table 13 may be undertaken without resource consent only if the activity complies with all the conditions/standards/terms column in the permitted activity rule.

Table 13. Summary of Regional Rules

RULE NUMBER AND TITLE		CLASSIFICATION	Page
6.3 LAND USE ACTIVITIES			
6.3.1 Bore drilling & leaking bores			
Rule 1	Bore drilling	Controlled	122
Rule 2	Bore drilling that does not comply with Rule 1	Restricted discretionary	122
Rule 3	Unwanted or leaking bores	Non-Complying	123
Rule 4	Decommissioning of bores	Permitted	123
6.3.2 Feedlots and feedpads			
Rule 5	Feedlots and feedpads	Permitted	124
Rule 6	Feedlots and feedpads not complying with Rule 5	Restricted discretionary	124
6.3.3 Vegetation clearance and soil disturbance			
Rule 7	Vegetation clearance and soil disturbance	Permitted	125
Rule 8	Vegetation clearance and soil disturbance activities that do not comply with Rule 7	Restricted discretionary	126
6.4 DISCHARGES TO AIR/LAND/WATER			
6.4.1 Agrichemicals – discharges to air/land/water			
Rule 9	Small scale application of agrichemicals	Permitted	127
Rule 10	Widespread application of agrichemicals	Permitted	128
6.4.2 Agricultural activities & other activities on production land – discharges to air/land/water			
Rule 11	Fertiliser use	Permitted	129
Rule 12	Stock feed	Permitted	129
Rule 13	Use of compost, biosolids & other soil conditioners	Permitted	130
Rule 14	Animal effluent	Controlled	131
Rule 15	Animal effluent in sensitive catchments	Discretionary	132
Rule 16	Management of solid waste on production land	Permitted	133
6.5 DISCHARGES TO AIR			
6.5.1 Combustion of fuel – discharges to air			
Rule 17	Combustion of specified fuels	Permitted	136
Rule 18	Combustion of specified fuels	Controlled	137
Rule 18a	Rule 18a has been withdrawn. Withdrawal effective from 1 July 2011	-	137
Rule 18b	Discharge to air from open fires – Napier & Hastings Airsheds	Prohibited	138
Rule 18c	Discharge to air from any small scale solid fuel burner – Hastings Airshed	Permitted	138
Rule 18d	Discharge to air from any small scale solid fuel burner – Napier Airshed	Permitted	139
Rule 18e	Rule number not used		139
Rule 18f	Discharge to air from any small scale solid fuel burner or open fire in a registered historic building – Napier & Hastings Airsheds	Permitted	140
Rule 18g	Discharge to air from any small scale solid fuel burner – Napier & Hastings Airsheds	Prohibited	140
Rule 18h	Discharge to air from any small scale solid fuel burner or open fire at property ownership transfer – Napier & Hastings Airsheds	Prohibited	141

RULE NUMBER AND TITLE RULE NUMBER AND TITLE		CLASSIFICATION	Page
6.5.2 Burning of waste – discharges to air			
Rule 19	Burning of waste	Permitted	142
Rule 19a	Burning of vegetative matter, paper, cardboard and untreated wood	Permitted	143
Rule 19b	Outdoor burning for specified purposes	Permitted	143
Rule 19c	Outdoor burning during certain times of the year	Non-complying	144
Rule 19d	Discharge to air from frost protection heaters	Permitted	144
Rule 19e	Outdoor burning on horticultural production land during certain times of the year – Napier & Hastings Airsheds	Permitted	145
Rule 20	Burning of specified waste in the open & in small scale fuel burning appliances	Prohibited	146
Rule 20a	Burning of waste for purposes of disease control or quarantine control	Permitted	147
6.5.3 Management of waste & other matter, excluding industrial & trade premises – discharges to air			
Rule 21	Waste & other matter, excluding industrial & trade premises	Permitted	148
6.5.4 Abrasive blasting – discharges to air			
Rule 22	Wet abrasive blasting	Permitted	149
Rule 23	Dry abrasive blasting – fixed source	Permitted	149
Rule 24	Dry abrasive blasting – moveable source	Discretionary	150
6.5.5 Moveable sources– discharges to air			
Rule 25	Moveable aggregate crushing & screening plants	Permitted	151
Rule 26	Moveable asphalt plants	Discretionary	151
Rule 27	Moveable road burners	Non-complying	151
6.5.6 Industrial & trade premises– discharges to air			
Rule 28	Miscellaneous industrial & trade premises	Discretionary	152
Rule 29	Minor discharges from industrial & trade premises	Permitted	153
6.5.7 Non-compliance with other rules– discharges to air			
Rule 30	Discharges that cannot comply with other rules	Restricted discretionary	155
6.6 DISCHARGES TO LAND/WATER			
6.6.1 Water– discharges to water			
Rule 31	Discharge of water	Permitted	156
6.6.2 Drainage water– discharges to land/water			
Rule 32	Discharge of drainage water (gravity flow systems)	Permitted	157
Rule 33	Discharge of drainage water (pumped systems)	Controlled	157
6.6.3 Bore drilling fluids – discharges to land/water			
Rule 34	Discharge of bore drilling fluids	Permitted	159
6.6.4 Domestic sewage– discharges to land			
Rule 35	Existing sewage systems	Permitted	152
Rule 36	Existing high discharge volume sewage systems	Restricted discretionary	153
Rule 37	New sewage systems	Permitted	153
Rule 38	Discharge of Septage	Discretionary	155
	Figure 6 – Design specifications for sewage systems	-	156
6.6.5 Landfills, transfer stations 7 waste oil – discharges to land/water			
Rule 39	Discharges from operating landfills & transfer stations	Discretionary	159
Rule 40	Discharges from closed landfills	Controlled	159
Rule 41	Discharge of waste oil	Non-complying	159
6.6.6 Stormwater– discharges to land/water			
Rule 42	Diversion & discharge of stormwater	Permitted	160

Rule 43 Diversion & discharge of urban stormwater	Controlled	160
Rules 44 – 46 these rule numbers have been 'banked' for possible future use	-	-

RULE NUMBER AND TITLE RULE NUMBER AND TITLE	CLASSIFICATION	Page
6.6.7 Generic discharges of contaminants– discharges to land/water		
Rule 47 Discharges to surface water (amended by Plan Change 6)	Permitted	170
Rule 48 Discharges of solid contaminants to land that will not enter water	Permitted	171
Rule 49 Discharges to land that may enter water	Permitted	172
Rule 50 Disturbance of bed of river/lake by livestock (amended by Plan Change 6)	Permitted	173
Rule 51 Disturbance of bed of river/lake by livestock	Discretionary	173
6.6.8 Non-compliance with other rules– discharges to land/water		
Rule 52 Discharges that do not comply with other rules	Discretionary	174
6.7 WATER TAKES, USES & DIVERSIONS		
6.7.1 Take & Use of water		
Rule 53 Minor takes & uses of groundwater	Permitted	175
Rule 54 Minor takes & uses of surface water (amended by Plan Change 6)	Permitted	176
Rule 55 Other takes and uses of surface & groundwater (amended by Plan Change 6)	Discretionary	177
6.7.2 Diversion of water		
Rule 56 Minor diversions	Permitted	178
Rule 57 Lawfully established diversions	Permitted	179
Rule 58 Diversions in artificial water courses	Permitted	179
Rule 59 Diversions that cannot comply with other rules	Discretionary	179
6.7.3 Transfer of water permits		
Rule 60 Transfer of permits to take & use surface water from a lake	Permitted	180
Rule 61 Transfer of permits to take & use surface water from a river (amended by Plan Change 6)	Controlled	180
Rule 62 Transfer of permits to take & use groundwater (amended by Plan Change 6)	Controlled	180
6.8 USE OF RIVERS & LAKE BEDS		
6.8.1 Use, repair & maintenance of structures		
Rule 63 Use of structures	Permitted	181
Rule 64 Maintenance of structures	Permitted	181
Rule 65 Replacement and upgrading of structures	Permitted	182
6.8.2 Removal & demolition of structures		
Rule 66 Removal & demolition of structures	Permitted	183
6.8.3 Erection and placement of dams & other barrier structure, & damming of water		
Rule 67 Dams, weirs & other barrier structures in rivers, lakes and artificial water courses	Permitted	184
Rule 68 Existing damming of water in rivers and lakes	Controlled	185
Rule 69 River and lake bed activities not expressly regulated by other rules	Discretionary	185
6.8.4 River control & drainage works & structures		
Rule 70 River control & drainage works & structures	Permitted	186
Rule 71 Activities affecting river control & drainage structures	Discretionary	187
6.8.5 Erection & placement of other structures (including access structures)		
Rule 72 Erection & placement of other structures, including bridges, culverts & other access structures	Permitted	188
6.8.6 River bed gravel extraction		
Rule 73 Small scale river bed gravel extraction	Permitted	189
Rule 74 Large scale river bed gravel extraction	Restricted discretionary	189
6.8.7 Other disturbances of river and lake beds		

Rule 75	Other disturbances of river and lake beds	Permitted	190
6.8.8	**Introduction & planting of plants**		
Rule 76	Planting of plants	Permitted	191

RULE NUMBER AND TITLE RULE NUMBER AND TITLE		CLASSIFICATION	Page
6.9	**Tukituki River Catchment specific rules**		
Rule TT1	Use of Production Land	Permitted	
Rule TT2	Use of Production Land	Restricted Discretionary	
Rule TT3	The take and use of surface water and groundwater for spray tanks	Permitted	
Rule TT4	The take and use of surface water and groundwater	Discretionary	
Rule TT5	The take and use of surface water and groundwater that does not comply with Rules TT3 and TT4	Non-complying	

6.6.5 GENERIC DISCHARGES OF CONTAMINANTS - DISCHARGES TO LAND/WATER

Rule	Activity	Classification	Conditions/Standards/Terms	Matters for Control/Discretion	Non-notification
47 **Discharges to surface water**[49] *Refer POL 71, 79*	The discharge of contaminants into surface water, pursuant to section 15 (1) (a) RMA, except as expressly regulated by other rules in this Plan.	**Permitted**[50]	a. The rate of discharge shall be no greater than 50 m^3/d. b. There shall be no adverse flooding effects on any property owned or occupied by another person, as a result of the discharge activity. c. There shall be no scouring or erosion of any land or any water course beyond the point of discharge. d. The discharge shall not cause the natural temperature[51] of any receiving water to be changed by more than 3°C from normal seasonal water temperature fluctuations, after reasonable mixing or cause an exceedence of the temperature limit in Table 5.9.1A (Tukituki River catchment). e. The discharge shall not cause the pH to change by more than 0.2 units, or to extend outside the range 6.5 to 9.0 units**,** after reasonable mixing. f. There shall be no production of conspicuous oil or grease films, scums or foams, or floatable or suspended materials, or any emission of objectionable odour, in any receiving water after reasonable mixing[52]. g. There shall be no conspicuous change in the colour or visual clarity of any receiving water after reasonable mixing or exceedence of the water clarity limits in Policy TT3(1) (Tukituki River catchment). h. The discharge shall not cause the biochemical oxygen demand to increase by more than 2 g/m^3 in any receiving water body after reasonable mixing or cause an exceedence of the biochemical oxygen demand limit in Policy TT3(1) (Tukituki River catchment). i. The discharge shall not cause any increase in the concentration of pathogenic organisms or cause an exceedence of the *E.coli* limits in Table 5.9.1A (Tukituki River catchment). j. The discharge shall not cause the concentration of dissolved oxygen in any river or lake to drop below 80% after reasonable mixing or cause an exceedence of the dissolved oxygen limit in Table 5.9.1A (Tukituki		

49 Rule 47 does not apply to the discharge of contaminants into water in relation to an existing high voltage electricity transmission activity. Refer to the Resource Management (National Environmental Standards for Electricity Transmission Activities) Regulations 2009.

50 **Compliance** - Where there is doubt about compliance with the Conditions (a) to (m) of Rule 47 it is the responsibility of the person undertaking the activity to prove to the council that the conditions are being complied with or a resource consent shall be required.

51 **"Natural temperature"** means the temperature which occurs naturally when the water is not influenced by known discharges or activities which may cause an increase or decrease in the temperature in the water.

52 See Glossary for a definition of **"after reasonable mixing".**

Rule	Activity	Classification	Conditions/Standards/Terms	Matters for Control/Discretion	Non-notification
			River catchment). k. The discharge shall not cause the concentration of ammoniacal nitrogen (NH_4^+) in any river or lake to exceed 0.1 mg/l after reasonable mixing or cause an exceedence of the acute total ammoniacal nitrogen limits in Policy TT3(1) or the chronic total ammoniacal nitrogen limits in Table 5.9.1A (Tukituki River catchment). l. The discharge shall not cause the concentration of soluble reactive phosphorus in any river or lake to exceed 0.015 mg/l or cause an exceedence of the dissolved reactive phosphorus limits in Table 5.9.1B (Tukituki River catchment) after reasonable mixing. m. The discharge shall not cause the concentration of any other contaminant (including other nutrients, heavy metals, hazardous substances and indicator bacteria), after reasonable mixing, to: i. Increase by more than 5% in any natural or modified receiving water body or 10% in any artificial receiving water body; ii. Exceed the following standards: a. The contact recreation guidelines contained in "Bacteriological Water Quality: Guidelines for Marine and Fresh Water" (Ministry of Health and Ministry for the Environment, December 1998). b. The guidelines for the protection of freshwater aquatic ecosystems contained in the "Australian Water Quality Guidelines for Fresh and Marine Waters" (ANZECC, 1992). iii. Exceed the limits for other toxicants in Table 5.9.1A (Tukituki River catchment).		
48 **Discharges of solid contamin-ants , including cleanfill, to land that will not**	The discharge of solid contaminants, including cleanfill, onto or into land in circumstances that will not result in any contaminant entering water, pursuant to section 15 (1) (d) and section 15 (2) RMA,	**Permitted**	a. The discharge shall not increase land instability or the risk of erosion. b. The discharge shall not cross the boundary of the subject property onto any other property, unless written approval is obtained from the affected property owner. c. The discharge shall not cause any increase in the concentration of any hazardous substances or pathogenic organisms on or in any land. d. The discharge shall not cause any increase in the risk of human or		

Rule	Activity	Classification	Conditions/Standards/Terms	Matters for Control/Discretion	Non-notification
enter water[53] *Refer POL 67*	except as expressly regulated by other rules in this Plan.		animal disease. e. The discharge shall not have any acid producing potential[54]. f. Upon request by the HBRC, a management plan, setting out how the conditions above will be met shall be prepared and provided to the HBRC. g. There shall be no discharge within 20 m of any surface water body, or over the Heretaunga Plains or Ruataniwha Plains unconfined aquifers as shown in Schedule IV, or within 20 metres of the coastal marine area, except for material extracted from a surface water body associated with the maintenance of legally established structures. h. Where the volume of solid contaminants on the subject property is greater than 100 m^3 the person responsible for the discharge shall notify the Hawke's Bay Regional Council within 7 days of that volume being reached or exceeded.		

Rule	Activity	Classification	Conditions/Standards/Terms	Matters for Control/Discretion	Non-notification
49 **Discharges to land that may enter water**[55] *Refer POL 16, 71, 79*	The discharge of contaminants onto or into land, in circumstances which may result in those contaminants (or any other contaminant emanating as a result of natural processes from those contaminants) entering water, pursuant	**Permitted**[56]	a. The rate of discharge shall be no greater than 50 m^3/d. b. The discharge shall not result in a breach of any of the conditions set out in Rule 47. c. The discharge shall not result in a breach of any of the conditions set out in Rule 48. d. The point of discharge shall occur no less than 600 mm above the winter ground water table. e. There shall be no surface ponding in the area of discharge, or runoff of any contaminant into a surface water body as a result of the discharge.		

53 Rule 48 does not apply to the discharge of contaminants to land that will not enter water in relation to an existing high voltage electricity transmission activity. Refer to the Resource Management (National Environmental Standards for Electricity Transmission Activities) Regulations 2009.

54 "**Acid producing potential"** is a laboratory measure of the ability of a rock or soil mass to generate acid drainage.

55 Rule 49 does not apply to the discharge of contaminants to land that may enter water in relation to an existing high voltage electricity transmission activity. Refer to the Resource Management (National Environmental Standards for Electricity Transmission Activities) Regulations 2009.

56 **Compliance** - Where there is doubt about compliance with the Conditions (a) to (l) of Rule 49 it is the responsibility of the person undertaking the activity to prove to the council that the conditions are being complied with or a resource consent shall be required.

Rule	Activity	Classification	Conditions/Standards/Terms	Matters for Control/Discretion	Non-notification
	to section 15 (1) (b) RMA, except as expressly regulated by other rules in this Plan.		f. The discharge shall not result in any airborne liquid contaminant being carried beyond the boundary of the subject property. g. There shall be no discharge within 20 m of any surface water body, or over the Heretaunga Plains or Ruataniwha Plains unconfined aquifers as shown in Schedule IV, except for material extracted from a surface water body associated with the maintenance of legally established structures. h. There shall be no surface ponding in the area used to store, mix or use the organic material, and no runoff of contaminants into any surface water body. i. There shall be no discharge within 30 m of any bore drawing groundwater from an unconfined aquifer into which any contaminant may enter as a result of the discharge. j. The discharge shall not cause any degradation of existing ground water quality in confined aquifers in the Heretaunga Plains and Ruataniwha Plains aquifer systems. k. For other aquifers, the discharge shall not cause or contribute to a breach of the following guidelines after reasonable mixing: i. The "Drinking Water Quality Standards for New Zealand" (Ministry of Health, 1995). ii. The guideline for irrigation contained in the "Australian Water Quality Guidelines for Fresh and Marine Waters" (Australian and New Zealand Environment and Conservation Council, 1998). l. Where the quality of ground water in any aquifer encompassed by condition (k) breaches the standards specified in that condition prior to the discharge occurring, the discharge shall not cause any further degradation of the quality of ground water in any such aquifer after reasonable mixing.		
50 **Disturbance of bed of river or lake by livestock**	Subject to Rule TT1, the disturbance of the bed of any permanently flowing river or any lake arising from the entry of	**Permitted**	a. Other than in the Tukituki River catchment, the disturbance shall not cause any conspicuous change[57] in the visual clarity of the water after reasonable mixing. b. Supplementary feed is not deposited on the bed of the river or lake.		

[57] For the purpose of Rule 50, **"conspicuous change**" means more than 20% change in clarity as measured by a 200 mm black disc as per "Water Quality Guidelines Number 2" published by the Ministry for the Environment.

Rule	Activity	Classification	Conditions/Standards/Terms	Matters for Control/Discretion	Non-notification
Refer POL *47, 79*	livestock.		c. Other than in the Tukituki River catchment,[58] the disturbance shall not result in faecal coliforms exceeding 200 cfu/100 ml in any receiving water after reasonable mixing.		
51 **Disturbance of bed of river or lake by livestock** *Refer POL 47, 79*	The disturbance of the bed of any permanently flowing river or any lake arising from the entry of livestock, which cannot comply with one or more conditions/standards/ terms in Rule 50.	**Discretionary**			Consent applications will generally be considered without notification and without the need to obtain the written approval of affected persons.

ADVISORY NOTES:

1. **Non-compliance with rules -** If any of the rules in this section cannot be complied with, then the activity is a discretionary activity under Rule 52.
2. **Discharges onto or into land that are not from industrial or trade premises** – Section 15(1)(d) of the RMA restricts the discharge of any contaminant from industrial or trade premises onto or into land. By contrast, the discharge of contaminants from other premises onto or into land is allowed (provided no contaminant enters water) unless specifically regulated by a rule.

[58] Refer Rule TT1

6.6.6 NON-COMPLIANCE WITH OTHER RULES - DISCHARGES TO LAND/WATER

Rule	Activity	Classification	Conditions/Standards/Terms	Matters for Control/Discretion	Non-notification
52 **Discharges that do not comply with rules 9-14, 16, 31-51** *Refer POL 14, 16, 17, 19, 22, 47, 48, 49, 71, 79*	The discharge of: • contaminants onto or into land, or into water, or • water into water which does not comply with any condition on a permitted activity rule, or any standard or term on a controlled activity rule within this Plan, but which is not expressly classified as a discretionary, non-complying or prohibited activity.	**Discretionary**			

6.7 Water Takes, Uses & Diversions

For information requirements refer to section 7.7

6.7.1 TAKE & USE OF WATER

Rule	Activity	Classification	Conditions/Standards/Terms	Matters for Control/Discretion	Non-notification
53 Minor takes & uses of ground water *Refer POL 24, 33, 77*	The take and use of groundwater, excluding the take and use of groundwater from the water management zones shown in Schedule VI.	**Permitted**	a. The total volume taken shall not exceed 20 m^3/d per property[59] (other than for aquifer testing, for which the volume of take is not restricted). Note that: • The take and use of water for reasonable domestic needs[60], stock drinking purposes and fire fighting, including from locations within the groundwater management zones in Schedule VI is not required to be included in this measurement. • When the permitted activity limit of 20 m^3 per day is exceeded a consent is required for the total take. b. The rate of take shall not exceed 10 l/s (other than aquifer testing, for which the rate of take is not restricted). c. The take shall not adversely affect any lawfully established efficient groundwater take[61], or any lawfully established surface water take, which existed prior to commencement of the take unless written approval is obtained from the affected person. d. The take shall not adversely affect any wetland[62].		

[59] For the purposes of this Plan the term **'property'** refers to one or more allotments as contained on a single certificate of title, and also includes all adjacent land that is in the same ownership.

[60] Refer to Glossary for definition of **"reasonable domestic needs"**.

[61] For the purposes of this Plan, **"efficient taking"** of groundwater means abstraction by a bore which penetrates an aquifer from which water is being drawn at a depth sufficient to enable water to be drawn all year (i.e. the bore depth is below the range of seasonal fluctuations in groundwater level), with the bore being adequately maintained, of sufficient diameter and screened to minimise drawdown, with a pump capable of drawing water to the land surface.

[62] For the purpose of this Plan the term **"wetland"** does NOT include:

- wet pasture land
- artificial wetlands used for wastewater or stormwater treatment
- farm dams and detention dams
- land drainage canals and drains
- reservoirs for firefighting, domestic or municipal water supply
- temporary ponded rainfall
- artificial wetlands.

Rule	Activity	Classification	Conditions/Standards/Terms	Matters for Control/Discretion	Non-notification
			e. A backflow prevention device shall be installed in circumstances where there is the risk of contaminants flowing down a bore used for taking groundwater, into a groundwater aquifer.		
54 **Minor takes & uses of surface water**[63] *Refer POL 35, 43*	The take and use of surface water, except from the following catchments, as shown in Schedule Via: • Maraekakaho Stream to confluence with Ngaruroro River. • Ahuriri Estuary catchment including Taipo Stream catchment. • Awanui Stream (including Poukawa Stream and Lake Poukawa catchments) to confluence with Karamu Stream. • Louisa Stream to confluence with Karamu Stream. • Papanui Stream. • Lake Tutira and catchment. • Herehere Stream. • Mangaroa Stream. • School Stream. • Karituwhenua Stream. • Te Waikaha Stream and • the whole of the Tukituki River catchment, except for existing takes occurring prior to 4 May 2013 which shall continue to be permitted.	**Permitted**	a. Except for takes occurring for a period of less than 4 weeks, the total volume taken shall not exceed 20 m^3/d[64] per property; (or per work site where the activity relates to the take and use of water for the maintenance of road reserves) nor shall the total volume exceed the reasonable needs of the user, whichever is the lesser. b. For takes occurring for a period of less than 4 weeks within any 90 day period, the total volume taken by any person shall not exceed 200 m^3 per 7 day period. c. The rate of take shall not exceed 10% of the instantaneous flow[65] at the point of take. d. The intake velocity shall not exceed 0.3 m/s. e. The activity shall not adversely affect any wetland. f. The take shall not adversely affect any lawfully established efficient groundwater take, or any lawfully established surface water take, which existed prior to commencement of the take unless written approval is obtained from the affected person.		

[63] The taking of water for an individual's reasonable domestic needs and the reasonable needs of an individual's animals drinking water is not restricted by this rule.

[64] When the permitted activity limit of 20 m^3 per day is exceeded, a consent is required for the total take.

[65] "**Instantaneous flow"** refers to the rate of river flow at the time of measurement.

Rule	Activity	Classification	Conditions/Standards/Terms	Matters for Control/Discretion	Non-notification
55 **Other takes & uses of surface & ground-water** *Refer POL 26-32, 36-43, 73, 77*	The take and use of surface water or groundwater, including takes and uses associated with or ancillary to Community Irrigation Schemes, except as provided for by Rules 53, 54, TT3 and TT4.	**Discretionary**		.	

ADVISORY NOTE:

1. **Bore drilling** – Note that a land use consent is required for the drilling, construction or alteration of any bore, in accordance with Rule 1.

6.7.3 TRANSFER OF WATER PERMITS

Rule	Activity	Classification	Conditions/Standards/Terms	Matters for Control/Discretion	Non-notification
60 **Transfer of permits to take & use surface water from a lake** *Refer POL36*	The transfer of a permit to take and use surface water from a lake, to another site.	**Permitted**	a. The transfer is to another site within the same lake.		
61 **Transfer of permits to take & use surface**	The transfer of a permit to take and use surface water from a river, to another site.	**Controlled**	a. The transfer is to another site within the same stream management zone,[60] where the flow is not significantly less than at the original site of abstraction. b. The transfer shall not result in any reduction in the rate of surface water recharge into groundwater.	a. Timing of take. b. Design of intake. c. Duration of consent. d. Review of consent conditions. e. Compliance monitoring. f. Volume of water required by, or	Consent applications will generally be considered without notification, without the need to obtain

[60] "**Stream Management Zone**" refers to the reaches of a river and/or its tributaries governed by a single minimum flow site.

Rule	Activity	Classification	Conditions/Standards/Terms	Matters for Control/Discretion	Non-notification
water from a river *Refer POL 36, 79*			c. The transfer shall not adversely affect any lawfully established surface water abstraction, which existed prior to transfer of the take. d. The transfer shall not result in any increase in adverse effects on aquatic ecosystems or fish passage.	reasonable needs of, transferee. g. In the Tukituki River catchment, the efficient use of water having regard to POL TT12:	the written approval of affected persons.
62 **Transfer of permits to take & use ground-water** *Refer POL 25, 77*	The transfer of a permit to take and use groundwater, to another site.	**Controlled**	a. The transfer is to another site within the same aquifer. b. The transfer is to a location at which the aquifer has the same or greater aquifer transmission and storage characteristics. c. The transfer shall not adversely affect any lawfully established efficient groundwater abstraction,[61] which existed prior to transfer of the take. d. The transfer shall not cause any reduction in the flow of any river or spring.	a. Aquifer testing. b. Duration of consent. c. Review of consent conditions. d. Compliance monitoring. e. Volume of water required by, or reasonable needs of transferee. f. In the Tukituki River catchment, the efficient use of water having regard to POL TT12	Consent applications will generally be considered without notification, without the need to obtain the written approval of affected persons.

[61] For the purposes of this Plan **"efficient abstraction"** of groundwater means abstraction by a bore which penetrates an aquifer from which water is being drawn at a depth sufficient to enable water to be drawn all year (i.e. the bore depth is below the range of seasonal fluctuations in groundwater level), with a pump capable of drawing water to the land surface.

SCHEDULES

The following new schedules are referenced in Plan Change 6:

Schedule XIV	Tukituki River sub-catchments (see Planning Maps)
Schedule XV	Water Management Zones (see Planning Maps)
Schedule XVI	Surface Water Allocation Zones and Minimum Flow Sites (see Planning Maps)
Schedule XVII	Groundwater Allocation Zones (see Planning Maps)
Schedule XVIII	Determination of Seasonal Allocation for Consent Held at Time of Notification
Schedule XX	Land with Slope over 15 degrees (see Planning Maps)
Schedule XIX	Methodology for Determining Nutrient Zone Loads
Schedule XXI	Records to be kept for Nutrient Budgeting
Schedule XXII	Farm Environmental Management Plan Requirements
Schedule XXIII	Total Ammoniacal Nitrogen Concentrations at Other pHs and Temperatures

Schedule XVIII: Determination of Seasonal Allocation for Consent Held at Time of Notification

Introduction

1. In accordance with Policy TT9, upon replacement, all consents are to have a specified seasonal or annual volume. The method for setting this volume will either be that outlined within this schedule, or will be set in accordance with Policy 42, whichever results in the lesser annual volume.

2. Policy 42 sets out the technical procedure used to establish allocation volumes. In essence this Policy establishes the parameters that can be used within a crop water model to calculate the volume of water needed to supply the specified security of supply. These models might include, but not be limited to, the Council crop water model (Morgan, 1997) or the Crop and Food SPASMO model.

3. The method to be used for setting the seasonal and annual volumes for existing consents is explained in this Schedule.

4. All annual and seasonal volumes apply to a water year, being 1 July to 30 June.

Non-Irrigation Consents

5. For non-irrigation consents, the annual volume will be determined as follows:

Non-irrigation consents, excluding dairy shed supply.	Weekly volume x 52
Dairy shed supply consents	Weekly volume x 40

Irrigation Consents

6. For irrigation consents, the seasonal volume will be calculated based on a ratio derived from the existing consented weekly volume divided by the estimated weekly crop water requirement calculated by the Morgan model. This ratio is then applied to the seasonal crop water requirement calculated by the Morgan model, so that the resultant seasonal volume to be imposed upon the renewal of the consent is a directly proportional to the existing consented weekly volume.

7. This *pro rata* approach has been used as it avoids the need to rely on the irrigation area, which may have changed over time. In some cases, irrigation areas and uses have increased, while the weekly volume has stayed the same as originally consented. Use of the increased area or use would give a relatively large seasonal volume, which does not reflect the intent of the original consented allocation, and which may be unreasonably large compared to the consented weekly volume.

8. The following formula explains the method for determining the seasonal volume:

   a = consented weekly volume (m^3/week)
   b = estimated 1:5 yr weekly crop water requirement (based on consent purpose and using the Morgan (1997) crop water calculator (m^3))
   A = estimated 1:5 yr seasonal crop water requirement (based on consent purpose and using the Morgan (1997) crop water calculator (m^3))
   B = seasonal volume (m^3/ water year) for consent renewal purposes

9. To calculate the seasonal volume for consent renewal purposes:

   (a/b) x A = B

10. Example:

A consent authorises abstraction of 2500 m^3/week, to irrigate 10 hectares of crops in Ongaonga. The Morgan crop water model indicates that 3,716 m^3/week is required in a 1 in 5 year drought. The crop water model also indicates that 48,950 m^3 is required in an irrigation season during this 1 in 5 year drought event.

a = 2,500 m^3/week
b = 3,716 m^3/week
B = 48,950 m^3

2,500/3716 = 0.67
A = 0.67x 48,950 = 32,797 m^3/ water year

Where the consented weekly volume exceeds the Morgan water model weekly estimate, the seasonal volume has been set to match the Morgan water model seasonal estimate (i.e. that required for the consented crop type and area in a season in a 1 in 5 year drought).

Data Tables – Consents Existing 10 October 2012

11. Estimated seasonal and annual volumes are displayed in Table 1 for all groundwater takes in the three groundwater allocation zones (Schedule XVII) the Tukituki River catchment as of 10 October 2012.

12. Estimated seasonal and annual volumes are displayed in Table 2 for all surface water takes and stream deleting groundwater takes in the Tukituki River catchment (Schedule XVI) as of 10 October 2012.

Table 1 - Groundwater Takes in the Allocation Zones Identified by Schedule XVII

Consent ID	Purpose	Consent Holder	Consent rate (L/s)	Consent volume (m^3/week)	Morgan Weekly Estimate (m^3/week)	Morgan Seasonal Estimate (m^3)	*Pro rata* seasonal volume (m^3)	Non-irrigation use estimate (m^3)
WP030592T	to take water from well no. 2210 (150 mm diameter) for an institutional domestic supply.	Camp David Trust	4	300.0	n/a	n/a	n/a	15,600.00
WP030596Ta	to take water from well no. 2041 (200 mm diameter) to irrigate 80 hectares of process crops	Katoa Farm Limited	25	15,120.0	28,730.0	391,600.0	206,090.92	
WP030618Ta	To take water and use from well no. 3159 (150 mm diameter) to irrigate 16 hectares of crops and pasture	Waireka Trust	15	5,850.0	6,146.0	94,320.0	89,777.42	
WP030621Tb	to take water from well no: 4295 (300 mm diameter) to irrigate part of 613 hectares of pasture and process crops	Dacre Farm Family Trust	52	27,500.0	220,144.0	3,000,635.0	374,834.00	
WP030623Ta	to take water from well no. 4685 and well no. 1426 (250 mm diameters) to irrigate 75 hectares of pasture	Holden D D	42	22,096.0	22,688.0	285,000.0	277,563.47	
WP030628Ta	to take water from well no. 4128 (150 mm diameter) to irrigate 5.3 hectares of golf greens	Takapau Golf Club Incorporated	12	1,613.0	1,603.0	17,490.0	*17,490.00*	
WP030629Ta	to take water from well no. 3434 (150 mm diameter) to irrigate 2.4 hectares of nursery	Pacey D J & S C	9	756.0	726.0	7,920.0	*7,920.00*	
WP030649T	to take water from well no. 1697 (250 mm diameter) to irrigate 6.8 hectares of process crops and pasture	S J Wilson Trust	15	1,757.0	2,442.0	33,286.0	23,949.02	
WP030661Tb	to take water from well no. 4820 (200 mm diameter) to irrigate 152 hectares of crops and pasture	Ashburn Farm Limited	32	18,270.0	54,587.0	744,040.0	249,026.52	
WP030669Tc	to take water from well no. 5687 (300 mm diameter) to irrigate 101 hectares of orchards and crops	Addavale Farming Company Limited	45	27,217.0	36,272.0	494,395.0	370,973.44	
WP030670Ta	to take water from well no. 4167 (350 mm diameter) to irrigate 200 hectares of crops and pasture	Drumpeel Land Co Limited	75	37,800.0	76,825.0	1,179,000.0	580,100.23	
WP030679Ta	to take water from well no. 1518 (200 mm diameter) to provide a supply of domestic/stock water to adjoining properties	Ingleton Farms Limited	2	190.0	n/a	n/a	n/a	9,880.00
WP030680Tb	to take and use water from well no. 1482 (250 mm diameter) well no. 1518 (200 mm diameter) and well no's 3870 & 4122 (300 mm diameters) to irrigate 360 hectares of pasture and for use in a dairy shed	Ingleton Farms Limited	158.5	82,760.0	108,900.0	1,368,000.0	1,039,629.75	
WP030681Tb	to take and use water from well no. 4593 (300 mm diameter) to irrigate 120 hectares of pasture and process crops and for use in a dairy shed	Ingleton Farms Limited	55	33,260.0	46,095.0	587,400.0	423,840.42	
WP030682Tb	to take water from a 250 mm bore (No. 1859) to irrigate part of 125 hectares of crops and pasture	Papawai Partnership	50	20,028.0	44,891.0	611,875.0	272,986.40	
WP030685Ta	to take water from well no. 2077 (150 mm diameter) to irrigate 20 hectares of nursery	Colin Schaw Family Trust	12	2,500.0	6,050.0	76,000.0	31,404.96	
WP030689Ta	to take water from well no. 4604 and well no. 4654 (200 mm diameters) to irrigate up to 116 hectares of pasture and crops	K A D D Farming Limited	58	29,524.0	41,659.0	567,820.0	402,417.67	

Consent ID	Purpose	Consent Holder	Consent rate (L/s)	Consent volume (m^3/week)	Morgan Weekly Estimate (m^3/week)	Morgan Seasonal Estimate (m^3)	*Pro rata* seasonal volume (m^3)	Non-irrigation use estimate (m^3)
WP030692Ta	to take water from well no. 3594 (150 mm diameter) to irrigate 20 hectares of pasture and crops	Finlay G C & J A	20	4,000.0	7,183.0	87,900.0	48,948.91	
WP030696Ta	to take water from well no. 1836, no. 1837 (200 mm diameters) and well no. 1900 (250 mm diameter) to irrigate 56 hectares of pasture	Greville R H & S D	64.5	15,600.0	16,940.0	212,800.0	195,966.94	
WP030697T	to take water from well no. 15036 (50 mm diameter) and well no. 1378 (100 mm diameter) to irrigate 1.2 hectares of pasture	Symmans R C	20	130.0	393.0	5,760.0	1,905.34	
WP030698T	to take water from well no. 15037 (75 mm diameter) and well no. 15038 (450 mm diameter) to irrigate 3 hectares of horticulture	Priest M G & J M	1.5	699.0	699.0	8,925.0	8,925.00	
WP030699Tb	to take water from well no. 2911 (200 mm diameter) to irrigate part of 285 hectares of process crops	Chapman Group Limited	20	10,080.0	102,351.0	465,025.0	137,393.40	
WP030710Ta	to take water from well no's 2242, 2277, 2278 and 2246 (250 mm diameters) to irrigate 157 hectares of horticulture	Mr Apple New Zealand Limited	131.1	38,204.0	47,193.0	596,600.0	482,963.71	
WP030711Ta	to take water from a 150 mm bore (No. 4418) to irrigate 44.5 hectares of olives	Ruataniwha Water Company Limited	4	1,200.0	8,422.0	73,255.0	7,038.00	
WP030712Ta	to take water from well no. 4418 (150 mm diameter) to irrigate 44.18 hectares of horticulture	Ruataniwha Water Company Limited	4	1,200.0	9,195.0	65,165.5	8,504.47	
WP030714Ta	to take water from well no. 3882 (250 mm diameter) to irrigate 37 hectares of crops	Sandford Pastoral Holdings Limited	30	13,000.0	13,288.0	181,115.0	177,189.57	
WP030724Ta	to take water from well no. 1475 (200 mm diameter) to irrigate 40 hectares of crops	Maramarua Farms Limited	22	13,300.0	14,365.0	195,800.0	181,283.68	
WP030730T	to take water from well no. 15035 (150 mm diameter) to irrigate 4 hectares of crops	Irwin Family Trust	10	1,487.0	1,537.0	23,580.0	22,812.92	
WP030731Tb	to take water from well no.1381 (200 mm diameter) to irrigate 28 hectares of pasture and crops.	Dermer R A & M I	15	3,800.0	10,056.0	137,060.0	51,792.76	
WP030732Tb	to take water from well no: 4672 (300 mm diameter) to irrigate part of 613 hectares of crops and pasture	Dacre Farm Family Trust	100	60,480.0	235,469.0	3,000,635.0	770,710.39	
WP030738Ta	to take water from well no. 2136 (200 mm diameter) to irrigate 2 hectares of pasture	McIntyre P J & H M	4.1	630.0	605.0	6,600.0	*6,600.00*	
WP030753Ta	to take water from well no. 2044 (200 mm diameter) and well no. 1656 (250 mm diameter) to irrigate 18.5 hectares of orchard	Riverside No. 2 Trust	22.5	4,780.0	5,596.0	70,300.0	60,048.96	
WP030759Ta	to take water from well no. 4563 (250 mm diameter) to irrigate 50 hectares of pasture, crops and for cow shed wash down	Newman Family Trust	30	13,175.0	19,206.0	294,750.0	202,193.65	
WP030762Ta	to take water from well no 4373 (250 mm diameter) to irrigate 44 hectares of pasture	Newman Family Trust	30	13,000.0	14,410.0	211,200.0	190,534.35	
WP030768Tb	to take water from well no. 1380 (250 mm diameter) to irrigate 55 hectares of crops and 5 hectares of pasture	Glen Athol Holdings Limited	25	13,000.0	21,264.0	288,225.0	176,209.79	
WP030771Ta	to take water from well no. 3204 (300 mm diameter) to irrigate 120 hectares pasture	Philip George KING & Company	30	18,000.0	36,300.0	456,000.0	226,115.70	

Consent ID	Purpose	Consent Holder	Consent rate (L/s)	Consent volume (m^3/week)	Morgan Weekly Estimate (m^3/week)	Morgan Seasonal Estimate (m^3)	*Pro rata* seasonal volume (m^3)	Non-irrigation use estimate (m^3)
WP030772Ta	to take water from well no. 3104 (300 mm diameter) to irrigate 46 hectares of horticulture	Bostock Organic Orchard Trust	45	12,460.0	13,915.0	174,800.0	156,522.31	
WP030780Ta	to take water from well no. 4656 (200 mm diameter) to irrigate up to 80 hectares of pasture	Belvue Downs Limited	25	15,120.0	24,200.0	304,000.0	189,937.19	
WP030786Ta	to take water from well no. 2160 (250 mm diameter)to irrigate 36 hectares of horticulture	Kiwi Farming Trust	32	9,752.0	10,890.0	136,800.0	122,504.46	
WP030787Ta	to take water from well no. 2219 (250 mm diameter) and well no. 2933 (300 mm diameter) to irrigate 116 hectares of horticulture	Mr Apple New Zealand Limited	110	31,442.0	35,090.0	440,800.0	394,973.88	
WP030789Ta	to take water from well no. 1383 (300 mm diameter) to irrigate 28 hectares of horticulture	Riverside No. 2 Trust	10	6,048.0	8,470.0	106,400.0	75,974.88	
WP030793Ta	to take water from well no. 1452 (300 mm diameter) no. 1880, (250 mm diameters) and well no. 2043 (200 mm diameter) to irrigate 186.1 hectares of orchard	Mr Apple New Zealand Limited	126	60,482.0	56,295.0	707,180.0	*707,180.00*	
WP030799Ta	to take water from well no. 4882 (300 mm diameter) to irrigate 240 hectares of pasture	Epic Agriculture Limited	125	75,600.0	72,600.0	912,000.0	*912,000.00*	
WP030804Tb	to take water from well no. 3155 (300 mm diameter) to irrigate up to 170 hectares of crops and pasture	Leafield Farms Limited	75	31,700.0	65,301.0	1,002,150.0	486,488.03	
WP030808Ta	to take water from well no. 1430 (200 mm diameter) to irrigate 30 hectares of crops	Rawhiti Dairies Limited	19	9,750.0	10,774.0	131,850.0	119,318.50	
WP030809Ta	to take water from well no. 1394 (250 mm diameter) to irrigate 69 hectares of crops	Buchanan Trust No. 2	37.1	22,245.0	24,780.0	337,755.0	303,202.58	
WP030810Tb	to take and use water from well no. 4049 (300 mm diameter) for use in a dairy shed and to irrigate 60 hectares of pasture	Stockade Pastoral Farms Limited	42	24,000.0	18,150.0	228,000.0	*228,000.00*	
WP030815Ta	to take water from well no. 15039 (200 mm diameter) to irrigate 56 hectares of pasture	Te Kura Family Trust	30	13,000.0	18,340.0	268,800.0	190,534.35	
WP030816T	to take water from well no. 1762 (150 mm diameter) for a Public Water Supply to Takapau Township	Central Hawke's Bay District Council	18.5	7,900.0	n/a	n/a	n/a	410,800.00
WP030823Ta	to take water from well no. 3852 (200 mm diameter) to irrigate 40 hectares of potatoes and 60 hectares of process crops	Anderson Ag Limited	60	36,000.0	35,913.0	489,500.0	*489,500.00*	
WP030827Ta	to take and use water from a 300 mm bore (No. 4489) to irrigate 456 hectares of process crops and to use in a dairy shed	Rawhiti Dairies Limited	27	16,160.0	163,761.0	2,004,120.0	197,767.35	
WP030832Tb	to take water from well no: 1826 (200 mm diameter) to irrigate 100 hectares of crops and pasture	Nochi Trust	72	35,913.0	35,913.0	489,500.0	489,500.00	
WP030864Tb	to take water from well no. 1379 (250 mm diameter) to irrigate 101 hectares of orchards and crops	Addavale Farming Company Limited	28	1,950.0	36,272.0	494,395.0	26,578.91	
WP040037Tb	to take water from well no's 4913 and 4722 (200 mm diameters) to irrigate 40 hectares of pasture and crops	Kiriwai Trust	10	12,100.0	14,365.00	175,800.00	148,080.75	

Consent ID	Purpose	Consent Holder	Consent rate (L/s)	Consent volume (m^3/week)	Morgan Weekly Estimate (m^3/week)	Morgan Seasonal Estimate (m^3)	*Pro rata* seasonal volume (m^3)	Non-irrigation use estimate (m^3)
WP040134Tb	to take water from well no. 15504 (100 mm diameter) to irrigate 11 hectares of viticulture	Ashworth J C	15	2,427.0	2,289.0	16,225.0	*16,225.00*	
WP040176T	to take water from well no. 2160 (250 mm diameter) to frost protect 36 hectares of horticulture	Kiwi Farming Trust	35	0.0		n/a	n/a	
WP040177T	to take water from well no. 2043, no. 1880, no. 1881 (250 mm diameters) and well no. 1452 (300 mm diameter) to frost protect 186.1 hectares of horticulture	Mr Apple New Zealand Limited	126	0.0	n/a	n/a	n/a	
WP040178T	to take water from 4 x 250mm bores (Nos. 2277, 2278, 2246, 2242) to frost protect 157 hectares of horticulture	Mr Apple New Zealand Limited	131.1	0.0		n/a	n/a	
WP040179T	to take water from a 250mm bore (No. 2219) and a 300mm bore (No. 2933) to frost protect 116 hectares of orchard	Mr Apple New Zealand Limited	110	0.0	n/a	n/a	n/a	
WP040193Tb	to take water from well no. 3854 (250 mm diameter) to irrigate 134 hectares of pasture and to supply water to a dairy shed	Cesped Lands Limited	70	42,210.0	40,535.0	509,200.0	*509,200.00*	
WP040260Ta	to take water from well no. 4840 (300 mm diameter) to irrigate 20 hectares of viticulture	Wilson A J & S C	15	4,600.0	4,663.0	59,500.0	58,696.00	
WP040261T	to take water from well no. 4840 (300 mm diameter) to frost protect 9.8 hectares of viticulture	Wilson A J & S C	40	0.0	n/a	n/a	-n/a	
WP040270Tb	to take water from well no. 15431 (250 mm diameter) to irrigate 40 hectares	Awassi NZ Land Holdings Limited	34	13,000.0	14,365.0	195,800.0	177,194.57	
WP050118Ta	to take water from a 200 mm bore (No. 3866) to irrigate 10.4 hectares of pasture and crops	Hutt G M	15	3,380.0	3,735.0	50,908.0	46,069.35	
WP060005T	to take water from well no. 4761 (300 mm diameter) to irrigate 130 hectares of pasture	Stockade Pastoral Farms Limited	70	40,572.0	39,325.0	494,000.0	*494,000.00*	
WP060045Ta	to take water from well no. 5167 (250 mm diameter) to irrigate 85 hectares of crops and pasture	Ingleton Farms Limited	31.5	18,900.0	30,526.0	416,075.0	257,610.48	
WP060284T	to take water from well no. 5435 (200mm diameter) to irrigate 32 hectares of pasture	Ashton Family Trust	28	10,480.0	9,680.0	121,600.0	*121,600.00*	
WP060375T	to take water from well no. 5392 (300 mm diameter) to irrigate 150 hectares of pasture	Nochi Trust	100	55,675.0	45,375.0	570,000.0	*570,000.00*	
WP060415T	to take water from well no. 5389 (150 mm diameter) to irrigate woodland garden and to supply a function centre.	Gibson Family Trust	3	1,814.0	n/a	n/a	n/a	29,024.00
WP060516Ta	to take water from well no. 5586 (300 mm diameter) to irrigate 150 hectares of process crops	Rawai Trust	60	24,192.0	53,869.0	659,250.0	296,062.23	
WP070076T	to take water from well no. 5497 (300 mm diameter) to irrigate 92 hectares of pasture	Ingleton Farms Limited	55	29,440.0	27,830.0	349,600.0	*349,600.00*	
WP070262Ta	to take water from well no. 5419 (300 mm diameter) to irrigate 188 hectares of pasture and/or crops	Gray Bros Limited	60	36,288.0	67,516.0	920,260.0	494,614.50	

Consent ID	Purpose	Consent Holder	Consent rate (L/s)	Consent volume (m^3/week)	Morgan Weekly Estimate (m^3/week)	Morgan Seasonal Estimate (m^3)	*Pro rata* seasonal volume (m^3)	Non-irrigation use estimate (m^3)
WP070547Ta	to take water from well no. 5344 (300 mm diameter) to irrigate part of 285 hectares of process crops	Chapman Group Limited	50	30,240.0	102,351.0	465,025.0	412,180.30	
WP080553T	to take water from well no. 5723 (300mm diameter) to irrigate part of 613 hectares of pasture and crops	Dacre Farm Family Trust	30	18,144.0	235,469.0	3,000,635.0	231,213.12	
WP080596T	to take water from well no. 5707 (300 mm diameter) to irrigate 196 hectares of crops and pasture	Owen Butler Trust	58	13,380.0	0.00	0.00	0.00	
WP090550T	To take and use water from well no. 4110 (300 mm diameter) to irrigate 80 hectares of crops and pasture	Anderson Ag Limited	32	15,500.0	28,730.0	391,600.0	211,270.45	
WP090564T	to take water from well no. 5997 (300 mm diameter) to irrigate part of 285 hectares of process crops	Chapman Group Limited	60	36,288.0	102,351.0	465,025.0	494,161.40	
WP100090T	to take and use water from well no's 3722 and 3774 (300 mm diameters) and well no's 1532 and 1402 (200 mm diameters) to irrigate part of 750 hectares of crops and pasture	Epic Agriculture Limited	160	101,225.0	269,344.0	3,260,625.0	1,379,731.00	
WP100367Tb	to take and use water from well no. 3495 (200 mm diameter) and 15682 (250 mm diameter) to irrigate 180 hectares of crops	Haowhenua Trust	83	50,198.0	69,163.0	971,100.0	704,817.28	
WP100392T	to take water from well no. 5498 (250 mm diameter) and well no. 1869 (250 mm diameter) to irrigate 155 hectares of pasture and process crops	Greg Wilson Trust	65	32,250.0	55,664.0	758,725.0	439,581.80	
WP100517Ta	to take and use water from well no. 15755 (300 mm diameter) to irrigate 338 hectares of pasture and crops	Gray L G & M A	63	47,663.0	121,384.0	1,638,455.0	716,024.80	
WP110307T	to take water from well no's 4764 and 4830 (300 mm diameters) to use for the irrigation of 610 hectares of crops and pasture within the irrigation areas shown for Site 1 and Site 2 in Appendix 1, and for use in a dairy shed on Site 1	Plantation Road Dairies Limited	220	115,804.0	219,066.0	2,318,000.0	1,578,451.00	
WP110335T	to take and use water from well no. 15932 (50 mm diameter) in a diary shed.	Plantation Road Dairies Limited	3	420.0	n/a	n/a	n/a	16,800.00
WP960223T	take water from well no. 3774 (300 mm diameter) for general dairy shed use including shed and yard wash down and use in refrigeration equipment	Epic Agriculture Limited	-	700.0	n/a	n/a	n/a	28,000.00
WP981038T	to take water from well no. 6715, no. 6716, no. 6720, no. 6721, no. 6723, no. 6724 (200 mm diameters) identified in Table 1 (see linked document) to provide a water supply to the Takapau meat plant	Silver Fern Farms Limited	-	35,000.0	n/a	n/a	n/a	1,365,000.00
N.B. 1	The values in italics in column '*Pro rata* seasonal volume (m^3)' are those where the consented weekly volume exceeds the weekly crop volume estimated using the Morgan model. The seasonal crop water estimate volume has been used rather that the *pro rata* volume.							

Table 1A: Groundwater Takes Outside of the Allocation Zones Identified in Schedule XVII, and Upstream of Red Bridge.

Consent ID	Purpose	Consent Holder	Consent Rate (L/s)	Consented Weekly Volume (m^3/week)	Morgan Weekly Estimate (m^3/week)	Morgan Seasonal Estimate (m^3)	*Pro rata* seasonal (m^3/year)	Non-irrigation Use Estimate (m^3)
WP030717T	to take water from well no. 2704 (200 mm diameter) to irrigate 7.6 hectares of pasture	Waipukurau Jockey Club Inc	12.6	2,470	2,489	28,880.0	28,659.5	
WP030754T	to take water from well no. 2031 (200 mm diameter) to irrigate 8 hectares of playing fields	Central Hawke's Bay College	5	2,500	2,620	30,400.0	29,007.6	
WP030773T	to take water from well no. 2387 (150 mm diameter) to irrigate 10 hectares of horticulture	Perthshire Farms Land Company Limited	8.8	2,709	3,275	43,000.0	35,568.5	
WP070428T	to take water from well no. 5099 (250 mm diameter) to provide a supply of water to a meat works	Bernard Matthews New Zealand Limited	22	5,100	N/A	N/A	N/A	265,200.0
WP090073T	to take water from well no. 5926 (200 mm diameter) for use in a pack house operation	Mr Apple New Zealand Limited	3	280	N/A	N/A	N/A	14,560.0
WP981008T	to take water from well no. 15046 (1200 mm diameter) to irrigate 4 hectares of crops	Ashby W J & C A	3.2	975	1,537	19,580.0	12,420.6	

Table 2 – Surface Water and Stream Depleting Takes

Consent No.	Consent Purpose	Consent Holder	Consent Rate (L/s)	Consented weekly volume (m^3/week)	Morgan Weekly Estimate (m^3/week)	Morgan Seasonal Estimate (m^3/week)	*Pro Rata* Seasonal Volume (m^3)	non-irrigation annual estimate (m^3)
WP000475T	to take water from well no. 15694 (100 mm diameter) to irrigate 8.4 hectares of orchard and viticulture	McNeill J J & Kiddle J C	15.0	2,220.0	2,751.0	40,320.0	32,537.4	
WP000485T	to take water from well no. 690 (150 mm diameter) to irrigate 12.7 hectares of orchard	Kiddle I B	6.0	3,185.0	4,159.0	60,960.0	46,683.7	
WP000528T	to take water from well no. 808 (100 mm diameter) to irrigate 10 hectares of orchard	Curkovic M & D	6.6	2,500.0	3,275.0	48,000.0	36,641.2	
WP000530T	to take water from well no. 1709 (100 mm diameter) to irrigate 6.1 hectares of orchard	Lawrence W G	4.2	1,620.0	1,998.0	19,280.0	15,632.4	
WP000540T	to take water from well no. 2535 (250 mm diameter) to irrigate 3 hectares of viticulture	Chateau Waimarama Company Limited	4.5	505.0	699.0	8,925.0	6,448.0	
WP010146T	to take water from well no. 15620 (100 mm diameter) to irrigate 4.8 hectares orchard and viticulture	Osborne H V & M J	6.3	1,255.0	1,572.0	23,040.0	18,393.9	
WP010247T	to take water from well no. 1241 (150 mm diameter) to irrigate 2.5 hectares of viticulture	Coxon T R & M J	100.0	140.0	583.0	7,438.0	1,786.1	
WP010500T	to take water from well no. 1277 (150 mm diameter) to irrigate 4.5 hectares of pasture and orchard	Cranwell D F & M E	3.8	1,360.0	1,474.0	21,600.0	19,929.4	
WP010537T	to take water from the Lower Tukituki River to irrigate 30 hectares of pasture	Longacre Farm	19.4	5,880.0	9,825.0	144,000.0	86,180.2	
WP020321Ta	to take water from a shallow trench adjacent to the Tukituki River to irrigate 30 hectares of pasture	Camp David Trust	20.0	9,825.0	9,825.0	144,000.0	144,000.0	
WP030382T	to take water from an unnamed tributary of the Hawea Stream by means of two 3cm diameter pipes (approx) for the domestic water supply of an 11 lot subdivision	Kahu Water Services Limited	5.0	308.0	n/a	n/a	n/a	16,016.0
WP030575T	to take water from the Papanui Stream to irrigate 16 hectares of viticulture	Jensen B M & J	10.0	2,016.0	2,331.0	29,750.0	25,729.7	
WP030584T	to take water from well no. 15047 (1200 mm diameter) adjacent to a tributary of the Waipawa River to irrigate 10 hectares of crops	Buckeridge R J & J A	10.0	3,250.0	3,841.0	53,950.0	45,648.9	
WP030585T	to take water from the MangaonukuStream & tributary to irrigate 10 hectares of pasture	Peter Butler Trust & Warwick Butler Trust	6.3	3,250.0	3,025.0	38,000.0	*38,000.0*	
WP030607Ta	to take water from well no. 4902 (250 mm diameter) adjacent to the Tukituki River for the irrigation of 30 hectares of viticulture and 60 hectares of process crops	Ormond P G	39.0	18,829.0	30,041.0	442,950.0	277,630.8	
WP030608Ta	to take water from a trench adjacent to the Waipawa River to irrigate 300 hectares of pasture and for use in a dairy shed	Plantation Road Dairies Limited	187.0	98,250.0	90,750.0	1,140,000.0	*1,140,000.0*	
WP030609T	to take water from the Tukituki River to irrigate 85 hectares of pasture	Tuki Tuki Awa Limited	50.0	30,240.0	25,713.0	280,500.0	*280,500.0*	
WP030610T	to take water from the Tukituki River via well no. 2747 (750 mm diameter), well no. 3092 (1000 mm diameter), and well no. 4411 (900 mm diameter) to irrigate 31.7 hectares of pasture	Tuki Tuki Awa Limited	28.0	13,650.0	9,589.0	104,610.0	*104,610.0*	
WP030611T	to take water from the Tukituki River to irrigate 30 hectares of horticulture	Sheep City Limited	15.0	8,126.0	9,825.0	129,000.0	106,692.5	

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WP030619Ta	to take water from a tributary of the MangaonukuStream to irrigate 40 hectares of crops and pasture	Cameron I M	38.0	6,500.0	14,365.0	195,800.0	88,597.3	
WP030635Ta	to take water from the Waipawa River to irrigate 36 hectares of crops and pasture	Rufus Robertson Trust	20.0	6,880.0	12,929.0	176,220.0	93,773.2	
WP030636T	to take water from the Waipawa-Mate Stream to irrigate 10 hectares of crops and pasture	Atkinson V C	25.0	3,150.0	3,591.0	48,950.0	42,938.6	
WP030647T	to take water from the Makaretu River to irrigate 57.5 hectares of pasture and or process crops	Clearview Partnership	32.0	4,450.0	20,650.0	252,713.0	54,458.7	
WP030648T	to take water from well no. 2364 (300 mm diameter) adjacent to the Tukituki River to irrigate 13.5 hectares of orchard	Corbett J C & S G Partnership	24.0	3,630.0	4,421.0	51,300.0	42,121.5	
WP030656T	to take water from well no. 4902 (250 mm diameter) adjacent to the Tukituki River to supply water to a maximum of twelve rural-residential properties	Ormond P G	39.0	540.0	n/a	n/a	n/a	28,080.0
WP030666T	to take water from the MangaonukuStream to irrigate 13 hectares of viticulture	Lime Rock Vineyard Limited	6.0	1,352.0	2,706.0	25,675.0	12,828.0	
WP030668T	to take water from a 150 mm well (No. 4495) adjacent to the Tukituki River to irrigate 3.5 hectares of olives and almonds	Tukituki Olives Limited	12.0	200.0	750.0	9,135.0	2,436.0	
WP030683Ta	to take water from the Kahahakuri Stream to irrigate 20 hectares of crops and pasture	G R Smith Childrens Trust	38.0	3,250.0	7,183.0	97,900.0	44,295.6	
WP030684T	to take water from well no. 2902 (100 mm diameter) adjacent to the Mangaonuku Stream to irrigate 20 hectares of crops and pasture	Tuturo Farm Limited	12.0	3,629.0	7,183.0	97,900.0	49,461.1	
WP030687T	to take water from a ponding area adjacent to a tributary of the Tukituki River for wash down use in a livestock saleyard	East Coast Regional Saleyards Proprietors	9.3	538.0	n/a	n/a	n/a	13,988
WP030693T	to take water from the Tukituki River to irrigate 26 hectares of viticulture	McGregor E W	20.0	6,000.0	6,061.0	77,350.0	76,571.5	
WP030694T	to take water from a 1350 mm well adjacent to the Tukituki River for the water supply of Hautope settlement	Hautope Water Scheme Incorporated	2.3	1,150.0	n/a	n/a	n/a	59,800.0
WP030701T	to take from well no. 2064 (150 mm diameter) adjacent to the Waipawa River to irrigate 15 hectares of orchard	Ocean 21 Group Limited	19.0	3,876.0	4,913.0	64,500.0	50,885.8	
WP030709T	to take water from well no. 2063 (150 mm diameter) close to the Waipawa River to irrigate 18 hectares of horticulture	Delugar A D & D H	45.5	2,800.0	5,895.0	77,400.0	36,763.4	
WP030713T	to take water from well no. 2830 (356 mm diameter) adjacent to the Tukituki River to irrigate 11 hectares of orchard	Mount Herbert Properties Limited	15.0	1,300.0	3,603.0	47,300.0	17,066.3	
WP030716Ta	to take water from the Waipawa River to irrigate 13.3 hectares of pasture	Cairns K R & B E	25.0	4,197.0	4,356.0	57,190.0	55,102.5	
WP030718T	to take water from a tributary of the MangaonukuStream to irrigate 40 hectares of crops and pasture	Irvine Agriculture Limited	15.0	6,500.0	14,365.0	195,800.0	88,597.3	
WP030719T	to take water from tributaries of the MangaonukuStream to irrigate 40 hectares of crops and pasture	Irvine Agriculture Limited	15.0	6,500.0	14,365.0	195,800.0	88,597.3	
WP030725T	to take water from the Tukituki River to irrigate 6 hectares of stonefruit, viticulture and nursery crops	Werrey D W	25.0	1,399.0	1,965.0	28,800.0	20,504.4	
WP030726T	to take water from the Tukituki River by means of a pump to irrigate part of 70 hectares of pasture	Hewitt G S & A L	25.0	2,600.0	22,925.0	301,000.0	34,137.4	

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WP030727T	to take water from the Papanui Stream to irrigate 24 hectares of pasture	Fox L G	20.0	7,560.0	7,860.0	115,200.0	110,803.1	
WP030728Ta	to take water from a tributary of the Kahahakuri Stream to irrigate 40 hectares of crops	Jones Family Trust	38.0	5,200.0	14,365.0	195,800.0	70,877.8	
WP030729T	to take water from the Tukituki River to irrigate 8 hectares of pasture and 4 hectares of market garden	Hamilton J C	20.0	3,780.0	4,157.0	55,980.0	50,903.2	
WP030733T	to take water from well no. 15043 (1600 mm diameter) adjacent to the Tukituki River for cooling water	Medallion Pet Foods (2005) Limited	4.0	2,073.0	n/a	n/a	n/a	107,796.0
WP030751T	to take water from the Papanui Stream for Te Aute College and Pukehou School including staff residence for domestic and stock use	Te Aute Trust Board Incorporated	2.5	1,500.0	n/a	n/a	n/a	78,000.0
WP030752T	to take water from the Mangatewai River to irrigate 105 hectares of pasture	Cooper Del Este Limited	31.0	12,000.0	31,763.0	346,500.0	130,907.0	
WP030756T	to take water from the Kahahakuri Stream to irrigate 18 hectares of process crops	McCutcheon Contractors Limited	15.0	5,850.0	6,464.0	88,110.0	79,740.6	
WP030763T	to take water from well no. 15041 (1.07 m diameter) adjacent to the Tukituki River, to irrigate 23 hectares of crops and pasture	Harding M B	25.0	6,500.0	8,835.0	112,585.0	82,829.9	
WP030764T	to take water from well no. 2181 and no. 2182 (200 mm diameter) adjacent to the Tukituki River to provide a rural house and stock water supply to 47 properties on Farm Road	Farm Road Water Supply Limited	16.4	9,900.0	n/a	n/a	n/a	514,800.0
WP030765Ta	to take water from well no. 2172 (200 mm diameter) adjacent to the Tukituki River to irrigate 8 hectares of crops	Thompson K T & J J	10.0	2,600.0	2,873.0	39,160.0	35,438.9	
WP030775T	to take water from well no. 15107, well no. 15108 and well no. 15109 (450 mm diameters) adjacent to the Tukituki River to provide a public water supply for Waipukurau Township	Central Hawke's Bay District Council	100.0	60,480.0	n/a	n/a	n/a	3,144,960.0
WP030776T	to take water from well no. 1461 (200 mm diameter) adjacent to the Tukituki River to irrigate part of 5.5 hectares of playing fields	Central Hawke's Bay District Council	6.0	1,780.0	1,801.0	23,650.0	*23,374.0*	
WP030778T	to take water from an unnamed tributary of the Tukituki River to irrigate 20 hectares of pasture	Breeze W T & N J	20.0	6,550.0	6,550.0	106,000.0	106,000.0	
WP030779T	to take water from a trench adjacent to the Waipawa River to irrigate 165 hectares of pasture	Franklin P C	140.0	51,000.0	49,913.0	544,500.0	*544,500.0*	
WP030788T	to take water from a tributary of the Tukipo River to irrigate 20 hectares of orchard and market garden	Riverside No. 2 Trust	15.0	3,250.0	7,183.0	97,900.0	44,295.6	
WP030790T	to take water from a pond close to the Tukituki River to irrigate 10 hectares of pasture and crops	Wilson D E	12.0	840.0	3,591.0	48,950.0	11,450.3	
WP030791T	to take water from the Kahahakuri Stream to irrigate 22 hectares of crops, pasture and horticulture	Ngatoro Farm Limited	28.0	8,125.0	7,901.0	107,690.0	*107,690.0*	
WP030817T	to take water from well no. 2402 (375 mm diameter) adjacent to the Waipawa River to provide a public water supply to Waipawa and Otane townships	Central Hawke's Bay District Council	35.0	21,168.0	n/a	n/a	n/a	1,100,736.0
WP030818T	to take water from the Waipawa River to provide a public water supply to Waipawa and Otane Townships	Central Hawke's Bay District Council	55.0	33,264.0	n/a	n/a	n/a	1,729,728.0

Consent No.	Consent Purpose	Consent Holder	Consent Rate (L/s)	Consented weekly volume (m^3/week)	Morgan Weekly Estimate (m^3/week)	Morgan Seasonal Estimate (m^3/week)	*Pro Rata* Seasonal Volume (m^3)	non-irrigation annual estimate (m^3)
WP030819T	to take water from well no. 10919 (1600 mm diameter) adjacent to the Tukituki River to irrigate 20 hectares of viticulture and use in a cafÚ/function centre and winery	Pukeora Estate Limited	5.0	2,800.0	4,163.0	39,500.0	26,567.4	
WP030824Ta	to take and use water from the Waipawa River for shingle washing	Infracon Limited	25.0	4,320.0	n/a	n/a	n/a	224,640.0
WP030825T	to take water from an open well (seepage hole) adjacent to the Tukituki River to wash shingle and manufacture ready mixed concrete	Infracon Limited	25.0	5,355.0	n/a	n/a	n/a	278,460.0
WP030826Ta	to take water from the Tukituki River to use for the irrigation of part of 600 hectares of pasture and crops	Rawhiti Dairies Limited	50.0	22,200.0	215,475.0	2,937,000.0	302,593.8	
WP030829T	to take water from the Tukipo River to irrigate 17 hectares of crops	Anderson Agriculture Limited	9.0	5,525.0	6,105.0	74,715.0	67,616.8	
WP030842Ta	to take water from a trench adjacent to the Waipawa River to irrigate 290 hectares of pasture	Franklin P C	100.0	60,000.0	87,725.0	957,000.0	654,545.5	
WP030863T	to take water from well no. 4163 (300 mm diameter) adjacent to a tributary of the Waipawa River to irrigate 100 hectares of pasture	Stockade Pastoral Farms Limited	50.0	26,400.0	30,250.0	380,000.0	331,636.4	
WP040005T	to take water from an unnamed tributary of the MangaonukuStream to irrigate 20 hectares of crops and pasture	Peter Butler Trust & Warwick Butler Trust	15.0	9,065.0	7,183.0	97,900.0	*97,900.0*	
WP040043T	to take water from the Kahahakuri Stream to irrigate 6.1 hectares of pasture	Jordan P B A	25.0	1,973.0	1,845.0	23,180.0	*23,180.0*	
WP040051T	to take water from the Kahahakuri Stream and Waipawa-Mate Stream to irrigate 28 hectares of process crops and pasture.	Glendinning E C	25.0	9,100.0	10,056.0	137,060.0	124,030.0	
WP040312T	to take water from the Waipawa River by means of a suction pump fixed to floating pontoon for dust suppression and aggregate washing	Winstone Aggregates Limited	8.0	2,073.0	n/a	n/a	n/a	107,796.0
WP040531Ta	to take water from well no. 1427 (200 mm diameter) adjacent to the Tukituki River to irrigate 40 hectares of process crops	David Phillips Limited	20.0	15,000.0	15,365.0	235,800.0	230,198.5	
WP040532Ta	to take water from the Tukituki River to irrigate up to 155 hectares of pasture and process crops	David Phillips Limited	40.0	16,250.0	59,539.0	913,725.0	249,383.3	
WP040556Ta	to take water from a shallow well no. 2413 (250 mm diameter) adjacent to the Tukituki River to irrigate 30 hectares of pasture	McGregor B A & J D Family Trust	15.1	9,132.0	9,825.0	159,000.0	147,785.0	
WP050017ta	to take water from the lower Tukituki River to provide two existing properties and an 11 lot rural residential subdivision with domestic and stock water.	Riverfield Holdings Limited	6.0	1,981.0	n/a	n/a	n/a	103,012.0
WP050150Ta	to take water from the Tukituki River by irrigate 31 hectares of pip fruit, viticulture and crops	Kaiwaka Trust	20.0	8,000.0	11,908.0	182,745.0	122,771.2	
WP050157Ta	to take water from the Tukituki River to irrigate 34 hectares of stonefruit and trees	Burbury N D	40.0	6,000.0	7,926.0	101,150.0	76,570.8	
WP050346T	to take water from well No. 4966 (diameter 100 mm) adjacent to the Tukituki River to provide a 14-20 lot subdivision with domestic water and irrigation for establishing trees	Eastwick Land Holdings & Andrew Coltart Family Trust	1.2	366.0	n/a	n/a	n/a	19,032.0
WP050518T	to take water from well no. 2543 (300 mm diameter) to irrigate 30 hectares of crops	Jones Family Trust	25.0	11,149.0	10,774.0	146,850.0	*146,850.0*	
WP060070Ta	take water from a soak hole adjacent to the Waipawa River for purposes of washing and processing shingle	Infracon Limited	20.0	3,456.0	n/a	n/a	n/a	179,712.0

Consent No.	Consent Purpose	Consent Holder	Consent Rate (L/s)	Consented weekly volume (m^3/week)	Morgan Weekly Estimate (m^3/week)	Morgan Seasonal Estimate (m^3/week)	*Pro Rata* Seasonal Volume (m^3)	non-irrigation annual estimate (m^3)
WP060688T	to take water from a dam of an unnamed tributary of the Kahahakuri Stream by means of a pump to fill holding tanks from which to irrigate 4 hectares of amenity plantings	Nochi Trust	10.0	1,260.0	1,210.0	13,200.0	*13,200.0*	
WP070587T	to take water from the Tukituki River via a soakhole to irrigate 110 hectares of process crops.	Pahia Trust	69.4	38,500.0	42,250.0	593,450.0	540,776.9	
WP070659T	to take water from the Tukituki River via a gallery to irrigate 80 hectares of pasture	Bell L G R & B M, Greer S A & Sawers W D	46.5	25,760.0	26,200.0	344,000.0	338,222.9	
WP080222Td	to take water from the Tukituki River via a gallery, or from well 1792 (356 mm diameter), to irrigate 10 hectares of viticulture, stone fruit, pasture and crops	Sarah Lauren Trust	4.0	2,331.0	3,841.0	58,950.0	35,775.2	
WP080223Tc	to take water from the Tukituki River via a gallery, or from well no. 1792 (356 mm diameter), to frost protect 10 hectares of viticulture and stone fruit	Sarah Lauren Trust	111.0	0.0	n/a	n/a	n/a	FROST
WP080304T	to take water from an unnamed tributary of the Papanui Stream for the purpose of a filling a storage pond to irrigate 90 hectares of process crops	Waireka Trust	86.0	35,000.0	n/a	n/a	*n/a*	610,000.0
WP080317T	to take water from well noÆs 5845 and 5846 (150 mm diameters) to frost protect 4 hectares of viticulture	Coory Family Trust	25.0	0.0	n/a	n/a	n/a	FROST
WP080325T	to take water from a tributary of the Tukipo River to irrigate 20 hectares of process crops	Wilson G P	15.0	1,730.0	7,183.0	97,900.0	23,578.9	
WP080388T	to take water from a dam to irrigate 60 hectares of process crops	Wilson G P	32.0	3,675.0	21,548.0	293,700.0	50,090.4	
WP080420T	to take water from an existing reservoir located in the Mangaonuku Stream catchment for dairy shed use	Edwards B D & R B	4.9	*3,000.0*	n/a	n/a	n/a	120,000.0
WP080611T	to take water from a storage reservoir within the Omakere Stream catchment to irrigate up to 152 hectares of pasture and crops	Rangitapu Trust	83.0	49,780.0	58,387.0	744,040.0	634,358.9	
WP090522Ta	to take and use water from the Tukituki River for the irrigation of part of 900 hectares of pasture and crops	Epic Agriculture Limited	100.0	60,480.0	323,213.0	4,405,500.0	824,362.4	
WP090523T	to take water from the Tukituki River to use for the irrigation of part of 600 hectares of pasture and crops	Rawhiti Dairies Limited	100.0	60,480.0	215,475.0	2,937,000.0	824,363.7	
WP090524T	to take water from the Tukituki River to use for the irrigation of part of 600 hectares of crops and pasture	Rawhiti Dairies Limited	50.0	25,200.0	215,475.0	2,937,000.0	343,484.9	
WP090534T	to take water from the Makaretu Stream via well no. 1376 (200 mm diameter) and no. 10918 (100 mm diameter) for club house water supply and to irrigate 47.7 hectares of greens, tees and fairways	Waipukurau Golf Club Incorporated	6.0	1,625.0	14,520.0	182,400.0	20,413.2	
WP090647T	to take water from a tributary of the Tukipo River to irrigate 70 hectares of pasture and process crops	Wallace Family Trust	38.0	13,813.0	25,139.0	342,650.0	188,274.2	
WP100149T	to take water from well no. 15044 (150 mm diameter) and well no. 15045 (500 mm diameter) adjacent to the Tukituki River to irrigate 165 hectares of pasture and crops	Perthshire Farms Land Company Limited	38.0	8,775.0	63,381.0	890,175.0	123,243.3	
WP100159T	to take and use water from the Waipawa River via well no. 15040 (1200 mm diameter) for club house supply, to irrigate 1 hectare of golf course greens, surrounds and trees	Waipawa Golf Club Incorporated & Mr Apple NZ Limited	8.8	450.0	328.0	4,300.0	*4,300.0*	

Consent No.	Consent Purpose	Consent Holder	Consent Rate (L/s)	Consented weekly volume (m^3/week)	Morgan Weekly Estimate (m^3/week)	Morgan Seasonal Estimate (m^3/week)	*Pro Rata* Seasonal Volume (m^3)	non-irrigation annual estimate (m^3)
WP100278T	to take and use water from an unnamed tributary of the Makaretu Stream to fill a reservoir, for subsequent irrigation	Ashworth J C	6.0	3,325.0	2,289.0	16,225.0	*16,225.0*	
WP100514T	to take water from the Tukituki River, to provide a domestic supply for an 18 lot subdivision on Tukituki Road, Havelock North	Arden Properties Limited	5.0	1,129.0	n/a	n/a	n/a	58,708.0
WP100591T	to take water from well No. 5211 (300 mm diameter), close to the Mangaonuku River, to irrigate 23 hectares of crops	Eltopia Agriculture Limited	30.0	7,533.0	8,260.0	112,585.0	102,675.9	
WP110094T	to take and use water from the Tukituki River via a gallery (well no. 15860, 900 mm diameter) to irrigate 3 hectares of viticulture and 5 hectares of lawns and trees	Craggy Range Vineyards Limited	10.0	1,500.0	1,682.0	23,325.0	20,801.1	
WP110264T	To take and use water from a dam on a tributary of the Tangatupura Stream for the purpose of irrigating 35 hectares of pasture	Elliot RL	50.0	11,460.0	11,463.0	133,000.0	132,965.2	
WP110302T	to take and use water from an unnamed tributary of the Waipawa River to fill a water storage reservoir, for the subsequent irrigation of part of 145 hectares of process crops	Addavale Farming Company Limited	15.0	9,072.0	52,073.0	n/a	n/a	300,000.0
WP110336T	to take and use water from a trench adjacent to the Waipawa River for milk cooling (non consumptive)	Plantation Road Dairies Limited	5.5	420.0	n/a	n/a	n/a	0
WP110532T	to take water from a trench adjacent to the Waipawa River for use in a dairy shed.	Franklin P C	2.0	280.0	n/a	n/a	n/a	11,200.0
WP100317T	to take and use water from a reservoir for irrigation of 11 hectares of viticulture	Ashworth J C	10.0	2,427.0	2,289.0	16,225.0	*162,250.0*	
WP030592T	to take water from well no. 2210 (150 mm diameter) for an institutional domestic supply.	Camp David Trust	4.0	300.0	n/a	n/a	*n/a*	15,600.0
N.B.1	The values in italics in column '*Pro rata* seasonal volume (m3)' are those where the consented seasonal exceeds the weekly crop water estimated. The seasonal crop water estimate volume has been used rather that the *pro rata* volume.							
N.B.2	The consent numbers in bold are those where the consent purpose has been extended.							

Schedule XIX: Methodology for Determining Nutrient Zone Loads

Introduction

In accordance with Policy TT1, in-stream nitrate-nitrogen (Nitrate-N) and dissolved reactive phosphorus (DRP) concentration limits have been set in order to meet freshwater quality objectives listed in Objective TT1. These limits apply across Zones 1 to 5 as specified in Table 5.9.1B.

Policies TT4(2) and TT5(2) anticipate Maximum Allowable Zone Loads (MAZLs) being determined to assist with monitoring effectiveness of the Plan. This schedule explains how the MAZLs will be calculated in relation to these policies.

The MAZL are a measure of the amount of nitrogen and phosphorus that can be generated by land use in the catchment without the concentration limits being exceeded. The nitrogen MAZL applies to the soil root-zone load. The phosphorus MAZL applies to instream load measured in the rivers.

Determining the Maximum Allowable Nitrogen Zone Load to meet Nitrate-N concentration limits

The model being developed by NIWA for the Tukituki River Catchment (TRIM2[66]) will be used to estimate nitrogen MAZL's. The methodology is as follows:

- TRIM2 is calibrated and validated against historic and current land-use and in-stream water quality and flow monitoring data;
- TRIM2 estimates attenuation[67] via groundwater and stream pathways;
- TRIM2 generates instream nitrogen loads, instream yields and instream concentrations of nitrogen and Nitrate-N for a range root zone loads;
- TRIM2 modelled instream water quality concentrations are compared to Table 5.9.1B Nitrate-N limits to identify an appropriate MAZL;
- As a cross-check, TRIM2 modelled instream yields are compared to measured instream yield / concentration relationships to determine if the modelled yields will breach the Table 5.9.1B Nitrate-N median and 95th percentile concentration limits.

The following monitoring points will be used to determine the MAZL for nitrogen:

- Zone 1: Tukituki River at Tamamu Bridge and Tukituki River at Red Bridge
- Zone 2: Waipawa River at SH2
- Zone 3: Tukituki River at SH2
- Zone 4: Tukituki River at SH50 and Waipawa River at SH 50
- Zone 5: Papanui at Middle Road and Tukituki River at Red Bridge

It is important to note that while Zones 2 and 3 have a nitrogen toxicity species protection level of 90%, it is the 95% species protection level of Zone 1 that limits the nitrate-N load that may leave Zones 2 and 3. The sum of the MAZLs for Zones 2, 3 and 4 must be sized such that the downstream Zone 1 nitrogen toxicity species protection level of 95% is not exceeded.

[66] The TRIM2 model framework utilises nutrient losses from land, predicted as annual losses of N and P based on land use mapping (AGRIBASE) and OVERSEER, and pathways from where nutrient leaves land to where it enters streams and rivers. It models nutrient travel times, nutrient attenuation, and nutrient impacts on plant growth in streams, including nutrient recycling. As occurs with all nutrient models, TRIM2 may be updated over time to better reflect actual nutrient cycle processes.

[67] *Nitrogen attenuation* – the nitrogen attenuation can be described as the proportion of nitrogen taken up by physical and biological processes in the soil, the groundwater and in streams and rivers after the nitrogen leaves the root zone but before it reaches a sampling point in the river or stream downstream

Measured in-stream loads, yields and concentrations

Average Instream Load - Instream load has been estimated using three methods – the averaging method, the Beale ratio estimator and the flow bin method (Uytendaal et al., 2013). The three results were reasonably consistent with the averaging method and the Beale ratio estimator being in closest agreement. The averaging method will be used for nutrient load calculations as it is easy to understand and it also provides annual estimates of loads, giving an appreciation of inter-annual variability.

For the averaging method, monthly load estimates are obtained by multiplying the monthly average in-stream concentration (usually a single sample) by the average monthly flow. These monthly loads are then summed to obtain the total annual load. The *Average Instream Load* is calculated by averaging the annual loads over the seven year analysis period, which is the period for which useable monitoring records are available.

The relationship between measured median and 95th percentile Nitrate-N concentrations and the measured average in-stream yield for the main stem sites on the Waipawa River and the Tukituki River is strong, with a correlation coefficient of 0.93 and 0.92 respectively. This relationship is used to determine the instream yield (kg/ha/year) that would result in a specific median or 95th percentile nitrate-nitrogen concentration limit in-stream that relates to the toxicity guidelines - for main stem sites on the Tukituki and Waipawa Rivers and is used a cross-check for TRIM2 modelled yields.

Actual nutrient loads measured in-stream are influenced by river flows and can therefore change from year to year. Flow data and water quality data in the Tukituki River catchment enable a five year rolling average in-stream nutrient load to be determined and this is to be used to determine actual catchment loads to compare to the MAZLs.

Determining the Maximum Allowable Zone Load for DRP

The instream load for DRP is determined in the same way as for Nitrate-N using the 'averaging' method. To derive the DRP MAZL, The extent that the measured instream DRP concentrations need to decrease to meet the Table 5.9.1B targets for each Water Management Zone is first calculated and then the measured in-stream load is reduced by that same factor to derive an allowable MAZL for each Zone. The DRP MAZLs will generally be less than the measured instream DRP load – namely a state of over-allocation exists.

SCHEDULE XXI - Records to be kept for Nutrient Budgeting

Records to be kept include:

(a) Identification of the land area of the farm.

(b) A map or aerial photograph showing the different blocks within the farm.

(c) Annual stocking rate (numbers, types and classes) including a breakdown by stock class for each month.

(d) A description of the farm management practices used on each block including (where applicable):

- (i) ground cover – pasture, crops, non-grazed areas (including forestry, riparian and tree areas);
- (ii) stock management – lambing/calving/fawning dates and percentages, any purchases and sales and associated dates, types and age of stock;
- (iii) fertiliser management practices - types, quantities, timing, location and rates of application and details of varying procedures for different blocks;
- (iv) winter management of cattle grazed off – including the use of feed pads, grazing off or standoff pads;
- (v) crop management practices – area cultivated, method of cultivation, crop types, rotations, timing of sowing and harvesting, resulting use of crop, where and when it is fed out on farm or when it is exported and where to;
- (vi) supplementary feed brought onto the farm - feed type, annual tonnage, dry matter content, feed quality, nitrogen content;
- (vii) use of nitrification inhibitors and any other verifiable nitrogen leaching inhibitors.

Advisory Note: Where any of the matters (i) to (vii) have not been implemented on a particular block then that should be stated.

(e) Copies of annual accounts to verify the above information.

(f) Copies of invoices or receipts for purchases of stock, fertiliser, supplements imported or exported.

(g) Farm animal effluent, pig farm effluent, feed pad and stand-off pad effluent management including:

- (i) area of land used for irrigation;
- (ii) annual nitrogen loading rate and nitrogen load rate per application;
- (iii) instantaneous application rate.

(h) Clean water irrigation in terms of areas irrigated, rates of water applied and irrigation systems used.

When records have not been kept, are insufficient or are otherwise not available then Council will calculate a nutrient budget by obtaining all audited annual accounts and any other records it can legally obtain to calculate a nutrient budget. Any information not able to be obtained will be estimated using generic industry specific nutrient models.

Schedule XXII: Requirements for Farm Environmental Management Plans

A Farm Environment Management Plan shall be prepared by a person with the appropriate professional qualifications. The plan shall take into account all sources of nutrients used for the farming activity and identify all relevant nutrient management practices and mitigation measures. The plan requirements will apply to:

1. a plan prepared for an individual property; or
2. a plan prepared for an individual property which is part of a collective of properties, including an irrigation scheme, an Industry Certification Scheme, or catchment club.

Plan requirements

The farm environment management plan must clearly identify how when the assigned industry 'good practices' and/or property nutrient allowances will be achieved. The plan shall contain as a minimum:

1. Property details
   (a) Physical address
   (b) Description of the ownership and name of a contact person
   (c) Legal description of the land and farm identifier
2. A map(s) or aerial photograph at a scale that clearly shows:
   (a) The boundaries of the property
   (b) The boundaries of the main land management units on the property.
   (c) The location of permanent or intermittent rivers, streams, lakes, drains, ponds or wetlands.
   (d) The location of riparian vegetation and fences adjacent to water bodies.
   (e) The location of storage facilities, offal or refuse disposal pits, feeding or stock holding areas, effluent blocks, raceways, tracks and crossings.
   (f) The location of any areas within or adjoining the property that are identified in a District Plan as "significant indigenous biodiversity".
3. An assessment of the risks to water quality associated with the major farming activities on the property and how the identified risks will be managed.
4. A description of how each of the following management objectives will, where relevant, be met.
   (a) *Nutrient management*: To maximise nutrient use efficiency while minimising nutrient losses to water in order to meet specified nutrient allowances.
   (b) *Irrigation management*: To operate irrigation systems that are capable of applying water efficiently and management that ensures actual use of water is monitored and is efficient.
   (c) *Soils management*: To maintain or improve the physical and biological condition of soils in order to minimise the movement of sediment, phosphorus and other contaminants to waterways.
   (d) *Wetlands and riparian management*: To manage wetland and waterway margins to avoid damage to the bed and margins of a water body, avoid direct input of nutrients, and to maximise riparian margin nutrient filtering.
   (e) *Collected animal effluent management*: To manage the risks associated with the operation of effluent systems to ensure effluent systems are compliant 365 days of the year.
   (f) *Livestock management*: To manage wetlands and water bodies so that stock are excluded from water in accordance with Rule TT1, to avoid damage to the bed and margins of a water body, and to avoid the direct input of nutrients, sediment, and microbial pathogens.

   The plan shall include for each management objective:
   i. user defined measurable targets that clearly set a pathway and timeframe for achievement of the objective
   ii. a description of the good management practices together with actions required to achieve the objective and targets.
   iii. the records for measuring performance and achievement of the target.

5. Nutrient budgets are prepared using the OVERSEER™ nutrient budget model, for each of the identified land management units and the overall farm.

Schedule XXIII: Total Ammoniacal Nitrogen Concentrations at Other pHs and Temperatures
Chronic total ammoniacal-N concentration (mgTNH_3-N/L) limit at different water pH and temperature.

	Water Temperature (˚C)															
pH	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
6.5	14.1	13.1	12.2	11.3	10.5	9.75	9.06	8.43	7.84	7.30	6.80	6.34	5.91	5.51	5.14	4.80
6.6	11.2	10.4	9.67	8.97	8.33	7.74	7.20	6.70	6.23	5.80	5.40	5.04	4.70	4.38	4.09	3.82
6.7	8.93	8.28	7.68	7.13	6.62	6.15	5.72	5.32	4.95	4.61	4.30	4.00	3.73	3.48	3.25	3.04
6.8	7.10	6.58	6.10	5.67	5.26	4.89	4.55	4.23	3.94	3.67	3.41	3.18	2.97	2.77	2.58	2.41
6.9	5.64	5.23	4.85	4.50	4.18	3.89	3.61	3.36	3.13	2.91	2.71	2.53	2.36	2.20	2.06	1.92
7.0	4.48	4.16	3.86	3.58	3.33	3.09	2.87	2.67	2.49	2.32	2.16	2.01	1.88	1.75	1.64	1.53
7.1	3.56	3.30	3.07	2.85	2.64	2.46	2.29	2.13	1.98	1.84	1.72	1.60	1.49	1.39	1.30	1.22
7.2	2.83	2.63	2.44	2.26	2.10	1.95	1.82	1.69	1.57	1.47	1.37	1.27	1.19	1.11	1.04	0.968
7.3	2.25	2.09	1.94	1.80	1.67	1.56	1.45	1.35	1.25	1.17	1.09	1.01	0.947	0.884	0.826	0.772
7.4	1.79	1.66	1.54	1.43	1.33	1.24	1.15	1.07	1.00	0.930	0.867	0.809	0.755	0.705	0.658	0.615
7.5	1.43	1.32	1.23	1.14	1.06	0.986	0.917	0.854	0.795	0.741	0.691	0.645	0.602	0.562	0.525	0.491
7.6	1.13	1.05	0.98	0.91	0.844	0.785	0.731	0.681	0.634	0.591	0.551	0.515	0.481	0.449	0.420	0.393
7.7	0.904	0.839	0.779	0.724	0.673	0.626	0.583	0.543	0.506	0.472	0.441	0.411	0.384	0.359	0.336	0.315
7.8	0.721	0.669	0.621	0.578	0.537	0.500	0.466	0.434	0.405	0.378	0.352	0.329	0.308	0.288	0.269	0.252
7.9	0.575	0.534	0.496	0.461	0.429	0.400	0.372	0.347	0.324	0.302	0.283	0.264	0.247	0.231	0.217	0.203
8.0	0.459	0.427	0.397	0.369	0.344	0.320	0.298	0.278	0.260	0.243	0.227	0.212	0.199	0.186	0.175	0.164
8.1	0.37	0.341	0.318	0.296	0.275	0.257	0.240	0.224	0.209	0.195	0.183	0.171	0.160	0.150	0.141	0.133
8.2	0.294	0.274	0.255	0.237	0.221	0.206	0.193	0.180	0.168	0.158	0.148	0.138	0.130	0.122	0.115	0.108
8.3	0.236	0.220	0.205	0.191	0.178	0.167	0.156	0.146	0.136	0.128	0.120	0.112	0.106	0.099	0.094	0.088
8.4	0.190	0.177	0.165	0.154	0.144	0.135	0.126	0.118	0.111	0.104	0.098	0.092	0.086	0.081	0.077	0.073
8.5	0.154	0.143	0.134	0.125	0.117	0.110	0.103	0.096	0.091	0.085	0.080	0.075	0.071	0.067	0.064	0.060
8.6	0.124	0.116	0.109	0.102	0.095	0.090	0.084	0.079	0.074	0.070	0.066	0.062	0.059	0.056	0.053	0.050
8.7	0.101	0.095	0.089	0.083	0.078	0.074	0.069	0.065	0.062	0.058	0.055	0.052	0.049	0.047	0.045	0.042
8.8	0.083	0.078	0.073	0.069	0.065	0.061	0.058	0.054	0.051	0.049	0.046	0.044	0.042	0.040	0.038	0.036
8.9	0.068	0.064	0.061	0.057	0.054	0.051	0.048	0.046	0.043	0.041	0.039	0.037	0.036	0.034	0.033	0.031
9.0	0.057	0.054	0.051	0.048	0.045	0.043	0.041	0.039	0.037	0.035	0.034	0.032	0.031	0.030	0.028	0.027
9.1	0.048	0.045	0.043	0.041	0.039	0.037	0.035	0.033	0.032	0.031	0.029	0.028	0.027	0.026	0.025	0.024
9.2	0.040	0.038	0.036	0.035	0.033	0.032	0.030	0.029	0.028	0.027	0.026	0.025	0.024	0.023	0.022	0.022
9.3	0.035	0.033	0.031	0.030	0.029	0.028	0.027	0.026	0.025	0.024	0.023	0.022	0.022	0.021	0.020	0.020
9.4	0.030	0.029	0.028	0.026	0.025	0.024	0.024	0.023	0.022	0.021	0.021	0.020	0.020	0.019	0.019	0.018
9.5	0.026	0.025	0.024	0.024	0.023	0.022	0.021	0.021	0.020	0.020	0.019	0.019	0.018	0.018	0.017	0.017

Acute total ammoniacal-N concentration (mgTNH_3-N/L) limit at different water pH and temperature.

	Water Temperature (˚C)															
pH	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
6.5	38.2	35.2	32.4	29.8	27.4	25.2	23.2	21.4	19.7	18.1	16.7	15.4	14.1	13.0	12.0	11.0
6.6	36.7	33.7	31.1	28.6	26.3	24.2	22.3	20.5	18.9	17.4	16.0	14.7	13.6	12.5	11.5	10.6
6.7	34.9	32.1	29.5	27.2	25.0	23.0	21.2	19.5	18.0	16.5	15.2	14.0	12.9	11.9	10.9	10.1
6.8	32.9	30.2	27.8	25.6	23.6	21.7	20.0	18.4	16.9	15.6	14.3	13.2	12.2	11.2	10.3	9.48
6.9	30.6	28.2	26.0	23.9	22.0	20.2	18.6	17.2	15.8	14.5	13.4	12.3	11.3	10.4	9.60	8.84
7.0	28.2	26.0	23.9	22.0	20.3	18.7	17.2	15.8	14.6	13.4	12.3	11.3	10.4	9.61	8.85	8.15
7.1	25.7	23.7	21.8	20.1	18.5	17.0	15.6	14.4	13.2	12.2	11.2	10.3	9.51	8.75	8.06	7.42
7.2	23.1	21.3	19.6	18.0	16.6	15.3	14.1	12.9	11.9	11.0	10.1	9.29	8.55	7.87	7.24	6.67
7.3	20.5	18.9	17.4	16.0	14.7	13.6	12.5	11.5	10.6	9.73	8.95	8.24	7.59	6.98	6.43	5.92
7.4	18.0	16.5	15.2	14.0	12.9	11.9	10.9	10.1	9.26	8.52	7.85	7.22	6.65	6.12	5.63	5.18
7.5	15.6	14.3	13.2	12.1	11.2	10.3	9.46	8.71	8.02	7.38	6.79	6.25	5.76	5.30	4.88	4.49
7.6	13.3	12.3	11.3	10.4	9.57	8.81	8.10	7.46	6.87	6.32	5.82	5.35	4.93	4.54	4.18	3.84
7.7	11.3	10.4	9.57	8.81	8.11	7.47	6.87	6.33	5.82	5.36	4.93	4.54	4.18	3.85	3.54	3.26
7.8	9.50	8.74	8.05	7.41	6.82	6.28	5.78	5.32	4.89	4.50	4.15	3.82	3.51	3.23	2.98	2.74
7.9	7.93	7.30	6.72	6.18	5.69	5.24	4.82	4.44	4.08	3.76	3.46	3.19	2.93	2.70	2.48	2.29
8.0	6.58	6.06	5.57	5.13	4.72	4.35	4.00	3.68	3.39	3.12	2.87	2.64	2.43	2.24	2.06	1.90
8.1	5.44	5.00	4.61	4.24	3.90	3.59	3.31	3.04	2.80	2.58	2.37	2.18	2.01	1.85	1.70	1.57
8.2	4.48	4.12	3.80	3.49	3.22	2.96	2.73	2.51	2.31	2.13	1.96	1.80	1.66	1.53	1.40	1.29
8.3	3.69	3.40	3.13	2.88	2.65	2.44	2.24	2.07	1.90	1.75	1.61	1.48	1.36	1.26	1.16	1.06
8.4	3.04	2.80	2.57	2.37	2.18	2.01	1.85	1.70	1.57	1.44	1.33	1.22	1.12	1.03	0.952	0.876
8.5	2.51	2.31	2.12	1.95	1.80	1.66	1.52	1.40	1.29	1.19	1.09	1.01	0.927	0.853	0.785	0.723
8.6	2.07	1.91	1.76	1.62	1.49	1.37	1.26	1.16	1.07	0.984	0.905	0.833	0.767	0.706	0.650	0.598
8.7	1.72	1.59	1.46	1.35	1.24	1.14	1.05	0.966	0.889	0.818	0.753	0.693	0.638	0.587	0.540	0.497
8.8	1.44	1.33	1.22	1.13	1.04	0.954	0.878	0.808	0.744	0.685	0.630	0.580	0.534	0.491	0.452	0.416
8.9	1.22	1.12	1.03	0.949	0.874	0.804	0.740	0.681	0.627	0.577	0.531	0.489	0.450	0.414	0.381	0.351
9.0	1.04	0.953	0.878	0.808	0.744	0.684	0.630	0.580	0.534	0.491	0.452	0.416	0.383	0.353	0.325	0.299
9.1	0.891	0.820	0.755	0.695	0.639	0.589	0.542	0.499	0.459	0.422	0.389	0.358	0.329	0.303	0.279	0.257
9.2	0.775	0.713	0.657	0.604	0.556	0.512	0.471	0.434	0.399	0.367	0.338	0.311	0.287	0.264	0.243	0.223
9.3	0.682	0.628	0.578	0.532	0.490	0.451	0.415	0.382	0.352	0.324	0.298	0.274	0.252	0.232	0.214	0.197
9.4	0.609	0.560	0.516	0.475	0.437	0.402	0.370	0.341	0.314	0.289	0.266	0.245	0.225	0.207	0.191	0.176
9.5	0.550	0.506	0.466	0.429	0.395	0.363	0.334	0.308	0.283	0.261	0.240	0.221	0.203	0.187	0.172	0.159