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## 14 Surface Water Quantity

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### 14.1 Introduction

This chapter addresses surface water quantity within the Tarawera River catchment, and discusses factors that may affect surface water quantity availability and allocation. Surface water is that which exists in lakes, rivers and wetlands. Matters related to groundwater are not discussed in this chapter, although it is important to recognise that surface and groundwater systems are interconnected. Groundwater is covered in Chapter 16 – *Groundwater Quality and Quantity*.

The flow of rivers and levels of lakes and wetlands in the Tarawera River catchment is influenced by a number of different factors. Some effects on water flows and levels are naturally occurring, termed natural perturbations, such as long-term and short-term rainfall changes and seasonal fluctuations in rainfall, while others are human-induced, such as abstractions, damming and diversions for agricultural or industrial purposes.

This chapter highlights those human-induced factors which are considered to affect, or have a potential effect, on river flows, and lake and wetland water levels. It concludes with a series of methods of implementation, including rules, aimed at avoiding, remedying or mitigating any actual or potential adverse effects related to the allocation of surface water.

The quantity of water in a water body has a direct bearing on a water body's ecosystem, its potential to flood, its use for a wide variety of purposes including recreational activities, and its ability to assimilate contamination. The main concern with regard to water quantity in rivers and lakes is the abstraction of water, rather than the discharge of water to surface water. In wetlands, the primary concern is the maintenance of water levels within ranges which will ensure the integrity of the natural environment and ecosystems.

In the catchments of the Tarawera Lakes and Upper Reach of the Tarawera River the primary factors contributing to the reduction in water levels and river flows over the last 50 years were the change and maturation of vegetation cover and low rainfall. Changing vegetation cover in these areas has generally been due to a shift from pasture and bare ground to scrub and exotic plantation forestry, resulting in a net reduced quantity of water reaching the Tarawera River and its tributaries. Over time this shift is expected to stabilise into a new hydraulic pattern for the catchment.

### 14.2 Monitoring River Flows and Water Levels

River flows and water levels in the Tarawera River catchment are continuously recorded at seven lake sites in the Tarawera Lakes catchments<sup>68</sup>, and at three sites on the Tarawera River<sup>69</sup>, see Table 9. Summarised flow data for river and stream sites is included in Appendix 11, and an outline of water monitoring facilities set out in Appendix 10. In addition, most of the wetlands in the catchment of the Lower Reach of the Tarawera River have a staff gauge to measure water levels.

The Tarawera River and the lakes in the Tarawera Lakes catchments have relatively steady flows or levels. The “sponge-like” pumice soils, combined with the reservoir-like Tarawera Lakes catchments, acts as a buffer to water inputs/outputs and gives the Tarawera River a relatively steady flow throughout the year. There is

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<sup>68</sup> Automatic water level recorders located on Lakes Okataina, Rotomahana, Okareka, and Tarawera.

<sup>69</sup> Lake Tarawera Outlet, Pipe Bridge (Onepu), and at Awakaponga.

no significant difference between the winter flow and the spring flow or the summer and autumn flows, on the Tarawera River. However, winter and spring flows are higher than summer and autumn flows.

The "sponge-like" pumice soils retain water during peak rainfall periods and release it gradually. Calculations, based on an average annual mean flow between 1984-1992, show that the Tarawera River flows at 6.4 cubic metres per second at the Lake Tarawera Outlet recording station, 20.6 cubic metres per second at Tasman Pulp and Paper Company Limited Pipe Bridge (Onepu), and 26.2 cubic meters per second, at Awakaponga. Approximately 26-29% of the flow of the Tarawera River, measured at Awakaponga, is fed directly from Lake Tarawera, which provides for a very steady year round flow. As an example of variation in flow rates, for the period 1972-1992, the maximum recorded flow at the Lake Tarawera Outlet recording station was 15.68 cubic metres per second, while the lowest recorded flow was 3.84 cubic metres per second. As a comparison, the maximum recorded flow in the Whakatane River (Valley Road) is 2,314 cubic metres per second, while the lowest recorded flow is 5.75 cubic metres per second. Further information on the flow of the Tarawera River and its major tributaries is displayed in Appendix 11.

The river flow is generally lower between December and May than between June to November. The highest frequency of low flows occurs in December, followed by April; while the highest frequency of flood flows occurs in July. Both floods and low flows can occur in February since the greatest rainfall variability occurs in summer<sup>70</sup>.

### 14.3 Primary Causes and Effects on River Flows and Lake and Wetland Levels

Apart from natural perturbations, such as seasonal rainfall patterns, river flows and lake and wetland water levels are generally only affected by three major human-induced factors: changing vegetation, point-source abstraction, and the diversion of water from wetlands.

The adverse effects of these activities in reducing water quantity variously include a reduction in the area of habitat available to aquatic life, changes in the nature of the stream (variations in the combination of pools and riffles), and changes in the river bed. There is also the possibility of changes in competition or predation opportunities and availability of cover, decreases in flow velocity or flow depth, and increases in water temperature with resultant decreases in the concentration of dissolved oxygen in the water. During low flows that pose an unacceptable threat to the ecology of a watercourse, Environment Bay of Plenty may decide to issue a water shortage direction under section 329 of the Resource Management Act 1991 to apportion, restrict or suspend the taking, use, damming or diversion of water, and/or the discharge of any contaminant into water.

#### 14.3.1 Changing Vegetation

A significant change in vegetation has occurred in the catchment since the mid-1960s. When combined with a regional rainfall decline over the past three decades, the effect on water flows in the Tarawera River has been significant. Compared with the annual mean flow for the period 1949-1963, the annual mean flow at Awakaponga decreased by 13% for the period 1964-1983, and by 25% for the period 1984-1992. Similarly, the 7 day low flow at Awakaponga reduced by 10% between 1964-1983 and by 21% between 1984-1992.

Significant vegetation changes are the result of large-scale exotic plantations, the regrowth of native forest, and reversion of areas from bare ground to scrub and native vegetation. Most of these vegetation cover changes have occurred in the catchments of the Tarawera Lakes and Upper Reach of the Tarawera River.

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Pang, 1993, xiii.

Large-scale afforestation occurred between 1962 and 1984. By late 1992 approximately 31% of the catchment was planted in exotic production forestry, predominantly in the catchment of the Upper Reach of the Tarawera River. Water balance modelling and statistical analysis undertaken by Environment Bay of Plenty<sup>71</sup> were two methods used to distinguish the effect of changing vegetation cover in the catchment on water flows in the Tarawera River, as distinct from those reductions resulting from the decline in regional rainfall<sup>72</sup>.

The general decline in the flow of the Tarawera River is indicated in Tables 9 and 10.

**Table 9**

**REDUCING FLOW IN THE TARAWERA RIVER (1949-1992)**

| Location             | Period  | Mean Annual Flow (m <sup>3</sup> /s) | Mean Annual 7 day low flow (m <sup>3</sup> /s) | 5 year return, 7 day low flow (m <sup>3</sup> /s) |
|----------------------|---|--------------------------------------|--|---|
| Awakaponga           | 1949-1963   | 35                                   | 26.5   |   |
|                      | 1964-1983   | 30.5                                 | 23.8   |   |
|                      | 1984-1992   | 26.2                                 | 20.9   | 19.28   |
| Pipe Bridge          | <u>With abstraction of 2.7 m<sup>3</sup>/s by Tasman Pulp and Paper Company Limited</u> |                                      |  |   |
|                      | Oct. 1991-Mar. 1993   | 19.8                                 | 16.58  |   |
|                      | 1984-1992 (predicted)   | 20.6                                 | 17.4   | 16.54   |
| Lake Tarawera Outlet | 1972-1983   | 7.0                                  | 5.4  |   |
|                      | 1984-1992   | 6.4                                  | 4.7  | 4.41  |

From Pang L, 1993, Report 93-2

The reduced flow in the Lower Reach of the Tarawera River has reduced the ability of the river to assimilate major wastewater discharges downstream of Kawerau.

**Table 10**

**REDUCTION IN THE FLOW OF THE TARAWERA RIVER RESULTING FROM CHANGING VEGETATION COVER AND RAINFALL DECLINE**

(Measured at Awakaponga, compared with the period 1954-1963)

| Period  | 1964-1983 |                   | 1984-1992 |                   |
|---|-----------|-------------------|-----------|-------------------|
|   | %         | m <sup>3</sup> /s | %         | m <sup>3</sup> /s |
| <b>Flow Reduction</b>                                 |           |                   |           |                   |
| <b>Due to Rainfall Decline and Vegetation Changes</b> | 14        | 5.1               | 26        | 9.4               |
| <b>Due only to Vegetation Changes</b>                 | 9         | 3.2               | 18        | 6.4               |

From Pang L, 1993, Report 93-2

Vegetation cover changes are considered to have largely stabilised since 1984, due in large part to production forests reaching a sustained yield position. Future planting of production forest in the catchment will generally be in presently

<sup>71</sup> Pang, L, 1993.

<sup>72</sup> The Tarawera catchment is under the same rainfall regime as adjacent catchments. The long-term trends in regional rainfall are: increasing between 1954 and the mid-1960s, decreasing between the late 1960s and the early 1980s, and increasing between the mid 1980s and 1992.

afforested areas, with some additional planting expected in the Manawahe Hills, in the north-west of the catchment of the Lower Reach of the Tarawera River.

The future flow regime will generally be affected by the age of the exotic production forestry pine trees, the rainfall regime, and the natural growth of native forest and other vegetation cover. The effect of afforestation on water flows is expected to reach its peak and stabilise in the 1990s. Final stabilisation of the impact of changing vegetation cover on river flow is expected to occur around the end of the century.

#### 14.3.1(a) Changing Vegetation – Selected Management Alternative

Environment Bay of Plenty recognises that reduction in surface water levels and flows can result from extensive changes in vegetation cover along with long term changes in climate. Land use control (vegetation cover) is a matter over which both district and regional councils have responsibility. Environment Bay of Plenty's selected alternative is to encourage and work together with district councils to apply land use consents which take account of the consequences that a proposed land use is likely to have on catchment hydrology, and in particular any subsequent net reductions in surface water resources that may compromise the levels of lakes and wetlands and the flow of streams and rivers.

#### 14.3.1(b) Changing Vegetation – Supporting Technical Reports

The following technical reports, written as part of the preparation of this regional plan, contain more detailed information on changing vegetation and its effect in the Tarawera River catchment:

Ngapo, N 1994(May), Land Resource Assessment – Tarawera Catchment, Environment Bay of Plenty, Whakatane.

Pang, L 1993 (October), Tarawera River Flow Analysis, Environment Bay of Plenty, Whakatane.

### 14.3.2 Point-Source Abstraction

In May 1994 there were 39 resource consents (water permits) to take surface water in the Tarawera River catchment. This water is used for a range of purposes, including agricultural and industrial purposes, and for the maintenance of water levels in wetlands. A list of current consents relating to the Tarawera River catchment is available from Environment Bay of Plenty on request. There are an unknown number of small individual takes, primarily for domestic supply<sup>73</sup>, especially around the shores of Lakes Tarawera and Okareka, which at the time this regional plan was publicly notified, were permitted activities under Environment Bay of Plenty's general authorisation<sup>74</sup>, or are activities otherwise allowed for in the Resource Management Act 1991.

The total consented abstractions from the Tarawera River, by May 1994, were 278,300 cubic metres per day. The biggest single abstractions from the Tarawera River, by May 1994, were 278,300 cubic metres per day. The biggest single abstractions from surface water in the Tarawera River catchment are by the pulp and paper mills which in total had consents (by May 1994) to abstract a combined total of 267,000 cubic metres per day (combined maximum of 4.078 cubic metres per second) from the Lower Reach of the Tarawera River. Immediately upstream of the pulp and paper water abstraction points (Kawerau Bridge) the average mean annual flow of the Tarawera River is 20.6 cubic metres per second.

<sup>73</sup> Section 14 of the RMA allows, where there are no adverse effects on the environment, for the taking of water for the reasonable needs of individuals or stock drinking water, without the need of a resource consent.

<sup>74</sup> Included in the *Transitional Bay of Plenty Regional Plan*.

By 24 August 1994, Caxton Paper Limited (now Carter Holt Harvey Tissue) advised it was taking approximately 10,000 cubic metres of water per day and Tasman Pulp and Paper Company Limited advised taking 165,000 cubic metres of water per day, a combined take of 175,000 cubic metres per day, which is approximately 65% of their combined abstraction consent allocations. Both companies have programmes to actively reduce water use in their production systems.

Regardless of new technologies, the pulp and paper mills are going to continue to require large quantities of water. However, to achieve the aims of this regional plan, industry will be encouraged to investigate and apply new efficient water use options, together with impact minimising wastewater disposal options, such as land application, evaporation, or ocean outfalls, or other new or in-plant contaminant reduction technologies. In time these will result in a reduction in the quantity both of water used and contaminated water to be discharged. It is an important goal of this regional plan that total consumptive abstraction is kept to a minimum and efficiency in water utilization promoted.

There are few abstractions for domestic supply, stock watering, or irrigation from the Tarawera River downstream of the main pulp and paper mill and geothermal industry wastewater discharges. This is due to a number of factors, including the pollution of the river by pulp and paper effluent, and higher concentrations of minerals and heavy metals arising from natural and human-induced geothermal discharges. The diminished quality in the lower river limits the use of the water for activities sensitive to low water quality.

Downstream of their abstraction points, various users, most notably the pulp and paper mills and a geothermal energy producer, have combined consent allocations to discharge up to 341,224 cubic metres per day of contaminated water to the Lower Reach of the Tarawera River. These discharges replace a significant proportion of the water abstracted from the Tarawera River upstream for the pulp and paper production.

#### 14.3.2(a)

##### Point-Source Abstraction – Selected Management Alternative

There are two policy alternatives for the control of the effects of point-source abstraction of surface water within the Tarawera River catchment, the continuation of the status quo, or the limiting of abstractions from the Tarawera River.

Due to the minimal effect on water levels of current abstraction from the lakes in the Tarawera Lakes catchments, and no significant foreseeable increase in demand, there is no need to impose policies or rules which restrict the abstraction of water from the lakes. However the taking of amounts exceeding 15 cubic metres per day will require a resource consent.

With regard to the Upper Reach of the Tarawera River and its tributaries, the selected policy alternative is to limit the taking of water by:

- a) Prohibiting any new consumptive abstraction over 5,000 cubic metres per day;
- b) Fixing the cumulative total of all consumptive abstraction within the reach of the Lower Reach of the Tarawera River at not greater than 200,000 cubic metres per day;
- c) Prohibiting any additional rates of consumptive abstraction by resource consent holders abstracting water at the time this regional plan was publicly notified; and
- d) Making the non-consumptive taking of water (where the full volume of water taken is returned to the river) a Discretionary Activity.

This is considered necessary to protect the contaminant assimilative capacity of the Lower Reach of the Tarawera River, and to protect and enhance the freshwater habitat, and associated wetlands, for fish purposes. The taking and discharging of water to maintain wetland levels, the taking of water for domestic use, stock watering, and fire-fighting purposes will continue as permitted activities. The need to maintain the assimilative capacity in the river water effects the ability of other water abstractors from taking the resource upstream from the mills, in particular iwi.

#### 14.3.2(b) Point-Source Abstraction – Supporting Technical Reports

No specific technical reports were written as part of the preparation of this regional plan, relating to the control of point-source abstractions from surface water in the Tarawera River catchment. However, Environment Bay of Plenty maintains a hydrology (river flow) database and a database containing abstraction allocation information relating to all resource consents granted within the Tarawera River catchment area.

### 14.3.3 Water Levels in Wetlands

Water diverted into and from wetlands represents the third major surface water quantity issue in the Tarawera River catchment. Most of the original wetlands on the Rangitaiki Plains have been lost through extensive drainage for agriculture and urbanisation. Approximately 1.7% of the original wetlands remain. Many of those remaining are threatened by continued drainage of surrounding land, resulting in dropping water table levels. The network of canals, channels, ditches and pumping schemes that criss-crosses the Rangitaiki Plains has increased the rate of runoff, reducing the amount of water that collects in wetland depressions. As a result there is a major problem of low water levels in wetlands resulting in dryland plants encroaching and smothering native wetland vegetation.

Most of the wetlands, apart from the Kohika wetland, are under Crown partnership, managed by the Department of Conservation. The Department of Conservation has appointed the Eastern Region Fish and Game Council to control and manage Awakaponga, Matuku and the southern half of Bregman and has assigned to it day to day management responsibilities for the southern half of the Awaiti Reserve.

Water levels in the wetlands are generally maintained by weir structures and flap gates. A number of the water inlet structures need repair, while in some, wetlands, such as the Tarawera Cut Wildlife Management Reserve, have no water inlets.

All of the major wetlands in the catchment of the Lower Reach of the Tarawera River were surveyed in early 1994 by Environment Bay of Plenty and the Department of Conservation. Staff gauges, to measure water levels, were installed and discussion held on the setting of appropriate water levels for the wetlands. In all cases, it was recommended that water levels be increased, though some of the desired maximum water levels have since been reduced in order to avoid any adverse effects, such as high water tables inducing drainage problems for surrounding areas. The effect of increasing the minimum water levels will be to sustain significant indigenous vegetation and ecosystems, and the natural character of these environments.

Considerable work will be required in many of the wetlands to ensure that water levels are maintained within their minimum and maximum water level ranges. This includes the upgrading and repair of water control structures, and in some cases minor stopbanking works.

As noted in Chapter 12 – *River and Lake Beds*, barriers to water passage, such as dams and inappropriately designed fords, can lead to a reduced ability of river and tributary channels to flush heavier sediments, and reduce the amount of total sediments flushed. Dams and weir structures can also lead to increases in water temperature. The regulation of these structures is dealt with in Chapter 12.

## 14.3.3(a) Water Level Control – Selected Management Alternative

Environment Bay of Plenty has considered two alternatives for the control of water levels in the wetlands in the lower river catchment: to remain with the status quo, or to take action to arrest the continued lowering of the wetland water levels. To remain with the status quo would create a real possibility that a number of existing wetlands will be drained in the medium term, with little possibility of the habitat which they support ever returning.

Environment Bay of Plenty's selected alternative is to set minimum and maximum water levels in the wetlands, at levels which will sustain the life-supporting capacity of the wetlands yet not significantly adversely affect the water tables of surrounding country, in particular farm land. In addition, Environment Bay of Plenty proposes to continue assisting financially with initial capital works directed at maintaining water levels in wetlands within determined minimum and maximum values. This action is considered necessary due to:

- The national importance of the natural character of wetlands;
- The significant number of wetlands in the lower catchment;
- Current (June 1994) low water levels in a number of the wetlands;
- The poor state of repair of a number of the water control structures; and
- A lack of prioritisation for wetland protection works by other wetland management organisations.

## 14.3.3(b) Water Level Controls – Supporting Technical Reports

The following technical reports and memorandums, written as part of the preparation of this regional plan, contain more detailed information on the control of wetland water levels:

Donald, R                    1994 (May), Tarawera River Regional Plan Technical Investigations – Freshwater Ecology Component, Environment Bay of Plenty, Whakatane

Titchmarsh, R            1994 (21 March), Tarawera River Regional Plan – Wetlands. Memorandum from Mr R Titchmarsh (Manager Technical Services) to Mr D Ponter (Regional Planner), Environment Bay of Plenty – *Unpublished*

## 14.4 Issues, Objective, Policies, Methods of Implementation, Principal Reasons and Anticipated Environmental Results

It should be noted that all works associated with structures related to the taking or discharge of water or wastewater to surface water, are to be undertaken according to the rules contained in Chapter 12 – *River and Lake Beds*.

Apart from the policy relating to the management of the discharge of waste geothermal fluid, the management of geothermal resources (surface features, field reservoir management, abstracted fluid and heat) is not considered in this regional plan. Objectives, policies and methods of implementation relating to the management of geothermal resources will be the subject of a separate geothermal regional plan to be prepared by Environment Bay of Plenty.

When rules in this chapter conflict with those in the *Bay of Plenty Transitional Regional Plan*, or where there is some ambiguity, the rules in this Regional Plan for the Tarawera River Catchment will take precedence.

## 14.4.1 Issues

The issues relating to surface water quantity are:

- 14.4.1(a) Human-induced reductions in river flows and lake and wetland levels, and the containment of water in streams and rivers, can adversely affect:
- aquatic ecology and biodiversity;
  - natural character;
  - other water body users, such as fishers and canoeists;
  - ability to assimilate wastewater.
- 14.4.1(b) Human-induced reductions in river flows and lake and wetland levels, and containment of water in streams and rivers, can contribute to:
- increases in temperature and reductions in dissolved oxygen;
  - increased toxicity in the Lower Reach of the Tarawera River in particular.
- 14.4.1(c) Human-induced changes in land cover have reduced stream and river flows in large parts of the catchment.
- 14.4.1(d) Wetlands on the Rangitaiki Plains are threatened by lowering of water tables and drainage.

## 14.4.2 Objective

Effective management of the surface water resources of the Tarawera River catchment to sustain and enhance life supporting capacities and natural character, while providing for a wide range of efficient uses and avoiding, remedying and mitigating adverse effects.

## 14.4.3 Policies

- 14.4.3(a) To ensure that people and communities continue to have access to sufficient water to provide for their wellbeing.
- 14.4.3(b) To ensure that the integrity of aquatic ecosystems and habitats is not adversely affected as the result of water allocation decisions.
- 14.4.3(c) To ensure that the natural character of water bodies is not adversely affected by water allocation decisions.
- 14.4.3(d) To ensure that the taking of water from surface water bodies does not adversely effect water quality to the extent that fisheries, wildlife and aquatic life are threatened.
- 14.4.3(e) To promote the conservation and efficient use of surface water by existing and future resource consent holders, and those taking water as a Permitted Activity.
- 14.4.3(f) To protect the assimilative capacity of the surface water resources of the Tarawera River catchment by considering in particular the cumulative effects of abstractions.
- 14.4.3(g) To provide water quantity information where available.
- 14.4.3(h) To promote land uses which do not adversely affect stream and river flows or lake and wetland levels.

## 14.4.4 Methods of Implementation – General

### Environment Bay of Plenty will:

- 14.4.4(a) Promote the maintenance of water levels in wetlands within established minimum and maximum levels, and promote water levels that ensure the integrity of natural ecosystems and natural character.
- 14.4.4(b) Contribute financial assistance for capital works associated with the initial restoration and development of wetland water level control structures, on the basis specified in Appendix 12, and consider funding on a case by case basis for the initial restoration and development of wetland water level control structures for other wetlands.
- 14.4.4(c) Promote the conservation and sustainable use of surface water resources.
- 14.4.4(d) Environment Bay of Plenty will assist district councils in identifying land uses that cause significant reduction in water surface resources and threaten to reduce water levels and flows, and in developing effective methods for controlling such land uses or promoting alternative ones.

## 14.4.5 Methods of Implementation – Rules

- 14.4.5(a) The taking, diverting or damming of surface water, or the discharging of water into surface water for the purpose of maintaining the levels of those wetlands indicated below, or for the express purpose of facilitating fish passage in and out of wetlands, or for controlling plant pest in wetlands, is a Permitted Activity, subject to compliance with the following minimum and maximum levels:

| Wetland                        | Minimum Level<br>(Metres Moturiki<br>Datum) | Maximum Level<br>(Metres Moturiki<br>Datum) |
|--------------------------------|---|---|
| Tarawera Cut Wildlife Mgmt Res | 00.50 metres                                | 00.90 metres                                |
| Bregman's Wildlife Mgmt Res    | 00.20 metres                                | 00.60 metres                                |
| Awaiti Wildlife Management Res | -0.20 metres                                | -0.06 metres                                |
| Lake Tamarenuui                | 11.93 metres                                | 12.43 metres                                |
| Tumurau Lagoon                 | 06.50 metres                                | 06.80 metres                                |
| Matata Lagoon                  | 00.55 metres                                | 00.80 metres                                |

subject to the water being taken, diverted, dammed or discharged in the same manner as it was when this regional plan was publicly notified.

*Note: The above rule relates to the taking, diverting, damming and discharge of water. Rules relating to the placement and maintenance of control structures are contained in Chapter 12 – River and Lake Beds.*

- 14.4.5(b) Except as provided by Rule 14.4.5(a), the taking, diverting, damming, or discharging of surface water into or out of any wetland is a Discretionary Activity restricted to the following activities:
- (i) For the purpose of achieving and maintaining the water levels of wetlands specified in Appendix 6 of this regional plan; or
  - (ii) For the express purposes of facilitating fish migration; or
  - (iii) For controlling noxious plants in any wetland.

- 14.4.5(c) Except as provided by Rules 14.4.5(a) and 14.4.5(b), the discharge of water into, or taking of water, from surface water in those wetlands specified in Appendix 12 of this regional plan, is a Discretionary Activity.
- 14.4.5(d) Except as restricted by Rules 14.4.5(a), 14.4.5(b) and 14.4.5(c), the taking of surface water at a volume equal to or less than 15 cubic metres per day for any purpose is a Permitted Activity, subject to the following condition:
- (i) The abstraction rate shall not exceed 5% of flow above the abstraction point or 10 litres per second whichever is the lesser, and the taking does not, or is not likely to, have an adverse effect on the ecology or habitat values of the water body.
- Environment Bay of Plenty may determine that an adverse effect on the ecology or habitat values of a water body is occurring if the sum of abstraction rates on a water body exceeds 10% of the 5 year low flow at any point.
- The 5 year low flow is defined as a flow equivalent to the lowest seven day mean flow statistically probable once in every five years.
- 14.4.5(e) Except as provided by Rule 14.4.5(f), the consumptive taking of water from the Upper Reach of the Tarawera River, the tributary streams of the Upper Reach of the Tarawera River, and the reach of the river from Kawerau Road Bridge across the Tarawera River to the Tasman Pulp and Paper Company Limited effluent outfall pipe at Grid Reference NZMS V15 365438 at a volume exceeding 5,000 cubic metres per day is a Prohibited Activity, and the cumulative total of all abstraction within this reach shall not exceed 200,000 cubic metres per day. The non-consumptive taking of water (where the full volume of water taken is returned to the river) shall be a Discretionary Activity that shall be assessed with particular regard to the protection of the assimilative capacity of the Lower Reach of the Tarawera River.
- 14.4.5(f) The taking of water from the Upper Reach of the Tarawera River, the tributary streams of the Upper Reach of the Tarawera River, and the reach of the river from the Kawerau Road Bridge across the Tarawera River to the Tasman Pulp and Paper Company Limited outfall pipe at Grid Reference NZMS V15 365438 for which a water permit was held on the date of the public notification of this regional plan may continue as a Discretionary Activity, and on expiry may be replaced as a Discretionary Activity, provided that the original volume allocated shall not be increased.
- 14.4.5(g) Except as provided by Rules 14.4.5(a) and 14.4.5(b) and restricted Rules 14.4.5(c) and 14.4.5(e), the taking of surface water within the Tarawera River catchment at a volume exceeding 15 cubic metres per day is a Discretionary Activity.
- 14.4.5(h) The damming of water in any river or stream shall be a Discretionary Activity, **except** that while the damming of water in any river or stream complies with the following conditions, it is a Permitted Activity:
- (a) the dam was constructed between 1 October 1990 and 1 October 1991 and was notified to Environment Bay of Plenty under General Authorisation No 7;
- or
- (b) the dam was constructed after 1 October 1991 and was notified to Environment Bay of Plenty under the provisions of the Bay of Plenty Transitional Regional Plan;
- or
- (c) the dam complies with all of the following conditions:

- (i) the damming does not adversely affect an existing wetland, Rules 14.4.5(a) and 14.4.5(b) have precedence.
- (ii) Environment Bay of Plenty is notified of the location and dimensions of the dam before construction commences.
- (iii) the mean annual flow of the river or stream dammed does not exceed 300 litres per second.
- (iv) the dam does not impound more than 5,000 cubic metres water and the lowest point in the dam crest does not exceed 1.8 metres vertical height relative to the natural bed of the river or stream in which the dam is sited.  
  
the dam does not impound more than 10,000 cubic metres water and the lowest point in the dam crest does not exceed 1.5 metres vertical height relative to the natural bed of the river or stream in which the dam is sited.
- (v) the dam is designed, constructed and maintained to ensure that its structural integrity is not compromised, and incorporates spillway and erosion protection devices to safely return surplus water to the natural bed of the river or stream in which the dam is sited.
- (vi) the dam does not adversely affect fisheries, fish passage, wildlife and aquatic life.
- (vii) the dam does not adversely affect the use or supply of water downstream.
- (viii) the impoundment of water upstream of the dam does not affect land owned or occupied by another person.

*Note: Environment Bay of Plenty Engineering staff are available to advise on the design and installation of small dams.*

14.4.5(i) When considering a resource consent application to take, discharge, dam or divert water within the Tarawera River catchment, Environment Bay of Plenty shall have particular regard to, but not be limited to, the following matters:

- (i) The requirements of Part II of the Resource Management Act 1991; and
- (ii) The requirements of sections 104 and 108 of the Resource Management Act 1991; and
- (iii) Any effects the proposal may have on riparian, shoreline or bed erosion; and
- (iv) The conservation and efficient use of water; and
- (v) The capacity of the water body to assimilate contaminants and any resulting or accentuated cumulative effects.

14.4.5(j) Any existing activity authorised by a resource consent, which, due to this regional plan becoming operational contradicts rules relating to maximum or minimum levels or flows or rates of use of water, or minimum standards of water quality ranges of temperature, may, after a period of six months after this regional plan becomes operational, be reviewed by Environment Bay of Plenty, pursuant to section 128(1)(b) of the Resource Management Act 1991, in any case where in the regional council's opinion it is appropriate to review the conditions of the permit in order to enable the levels, flows, rates, or standards set by a rule to be met.

Section 20(2) of the Resource Management Act 1991 shall apply where, as a result of a rule in this regional plan becoming operative, an activity that formerly was a Permitted Activity or which otherwise could have been lawfully carried out without a resource consent requires a resource consent.

## 14.4.6 Principal Reasons

Water is essential to life. The life-supporting capacity of water and ecosystems and the wellbeing of individuals and communities are closely affected by the availability of sufficient quantities of clean water. This regional plan recognises the importance of safeguarding sufficient quantities of water in the surface water bodies of the Tarawera River catchment.

Protection of the assimilative capacity (the ability of a water body to absorb and treat contaminants without degradation) of the Lower Reach of the Tarawera River affects the social and economic wellbeing of local communities that both use and live with the river. It also affects the economic viability of local industries that wish to take water from the river for production, yet also want to use the river water for waste disposal. The protection of the assimilative capacity of the river is of prime concern to tangata whenua who see this as an opportunity cost set against them. They are unable to abstract water if the abstraction would exceed the plan requirements on assimilative capacity and this contradicts their duty as kaitiaki for the river. Ensuring sufficient water quantity is also important for the wide range of water-related recreation activities in which New Zealanders take part.

The maintenance of appropriate water levels and flows is of greatest concern in the Lower Reach of the Tarawera River and in the wetlands on the Rangitaiki Plains. Environment Bay of Plenty proposes that where possible it is appropriate to set minimum and maximum water levels in wetlands in order to ensure that natural character, amenity values and the life-supporting capacity of the water and ecosystems are adequately safeguarded. Limitations on abstraction from the Upper Reach of the Tarawera River and its tributaries are aimed at protecting the assimilative capacity of water in the Lower Reach of the Tarawera River. In order to ensure that these limitations will not always be necessary, Environment Bay of Plenty promotes the conservation and efficient use of water, and does not intend allowing increases in either the net amounts of water abstraction, or the effects of contaminant discharges.

Due to the large quantity of water in the catchment lakes, minimal current abstraction of lake water, and the unlikelihood of significant future abstraction, Environment Bay of Plenty does not consider it necessary to unduly restrict abstraction from lakes at this time.

The promotion of land uses which do not adversely affect stream and river flows or lake and wetland levels is considered an appropriate response to the significant effect which some land uses can have on water levels and flows. Due to the many positive benefits which these land uses can otherwise bring, it is not considered appropriate to prohibit them. The promotion of gradual changes through land use controls in district plans is considered the most appropriate means of reducing those adverse effects which some high water-consumption land uses have on water levels and flows.

## 14.4.7 Anticipated Environmental Results

The anticipated environmental results are:

- 14.4.7(a) Protection of the assimilative capacity of the Lower Reach of the Tarawera River.
- 14.4.7(b) Enhancement and protection of the natural character and life-supporting capacity of wetlands on the Rangitaiki Plains.
- 14.4.7(c) Protection of the life supporting capacity of water bodies in the Tarawera River catchment.

- 14.4.7(d) Rivers, lakes and wetlands are kept available for a wide variety of amenity activities requiring sufficient water quantity.
- 14.4.7(e) Water is utilised in an efficient manner and the need for large amounts of water is reduced.

