

**Proposed Plan Change 4A
(Groundwater and
North Otago Volcanic Aquifer)**

**Regional
Plan: Water
for Otago**

Introduction

The Otago Regional Council has prepared Proposed Plan Change 4A (Groundwater and North Otago Volcanic Aquifer) to the Regional Plan: Water for Otago. Proposed Plan Change 4A builds on the groundwater management system of taking water within a maximum allocation volume, established under Plan Change 1C (Water Allocation and Use)¹, with focus on the North Otago Volcanic Aquifer:

North Otago Volcanic Aquifer

- Replace management of the Deborah and Waiareka Aquifers with the North Otago Volcanic Aquifer.
- Extend the boundaries of the North Otago Volcanic Aquifer.
- Set a maximum allocation volume for the North Otago Volcanic Aquifer.

Groundwater management framework

- Add a new schedule of matters to be considered when setting maximum allocation volumes and restriction levels.
- Provide a framework for calculation of consented groundwater allocation.
- Define the purpose and use of restriction levels.
- Allow the effect of groundwater take on an aquifer's properties to be considered under the restricted discretionary rule.
- Provide for management of groundwater takes where there is a risk of aquifer contamination.

Community groundwater supplies

- Identify additional groundwater takes used for community supply consented prior to 28 February 1998.
- Provide for restriction levels to be applied to groundwater takes used for community supply.
- Provide for connected groundwater takes used for community supply and listed in Schedule 3B, to be exempt from minimum flows.

Groundwater volumes taken as a permitted activity

- Simplify groundwater volumes that can be taken without consent.

Roxburgh Aquifer

- Correct restriction levels to reflect mean sea-level datum.

The changes to the Regional Plan: Water for Otago resulting from Proposed Plan Change 4A are detailed in this document. This document should be read in conjunction with:

- Section 32 Report – Consideration of alternatives, benefits and costs; and
- The Regional Plan: Water for Otago incorporating Council decisions on Proposed Plan Change 1C (Water Allocation and Use) 10 April 2010.

¹ Proposed Plan Change 1C (Water Allocation and Use) was notified on 20 December 2008. Council's decisions were released on 10 April 2010 and appeals closed on 24 May 2010. The appeals should not have any significant effect on Proposed Plan Change 4A.

Amendments to the Water Plan as a result of Proposed Plan Change 4A are shown as follows: (additions underlined, deletions ~~struckout~~).

Any person may make submissions on this proposed plan change. You may do so by sending written submissions to the Otago Regional Council. The submission must be in Form 5, as prescribed by Schedule 1 of the Resource Management Act 1991. Copies of this form are available by phoning the Council on 0800 474 082, or can be found on the ORC website www.orc.govt.nz. When making a submission, please ensure you state the reference number of the provision you are submitting on (refer to the table of contents on page (iii)).

Post to	Otago Regional Council Private Bag 1954 Dunedin 9054		
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If you have any questions concerning the process:

Telephone	(03) 474 0827; 0800 474 082
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Submissions close at 5 pm on Monday 18 October 2010.

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*Regional Plan: Water for Otago incorporating Council decisions on Proposed Plan Change 1C (Water Allocation and Use), 10 April 2010.

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Water Quantity



6.1 Introduction *[unchanged]*

6.2 Issues *[unchanged]*

6.3 Objectives *[unchanged]*

6.4 Policies applying to the management of the taking of water

Integrated Water Management

6.4.0 to 6.4.1 *[unchanged]*

6.4.1A A groundwater take is allocated as:

- (a) **Surface water, subject to a minimum flow, if the take is from any aquifer in Schedule 2C; or**
- (b) **Surface water, subject to a minimum flow, if the take is within 100 metres of any connected perennial surface water body; or**
- (c) **Groundwater and part surface water if the take is 100 metres or more from any connected perennial surface water body, and depletes that water body most affected by at least 5 litres per second as determined by Schedule 5A; or**
- (d) **Groundwater if (a), (b) and (c) do not apply.**

Explanation

Most aquifers share a hydrological connection with adjoining surface water bodies. The degree of connection varies in significance, and this is reflected in the four ways of managing groundwater allocations. Some aquifers are identified on Maps C1-C17. Where the maps show aquifers overlapping, the Council will identify which aquifer the groundwater is to be taken from (e.g. from borelogs or water chemistry analyses).

[Rest of policy remains unchanged].

6.4.2 to 6.4.7 *[unchanged]*

6.4.8 Minimum flows required by Policies 6.4.1A, 6.4.3, 6.4.4 or 6.4.6 will not apply to community water supply takes identified in Schedules 1B or 3B.

Explanation

~~Under low flow conditions, priority is given to protecting takes for community water supply in primary allocation. This policy exempts scheduled community water supplies from restriction in terms of the minimum flow requirements of Policies 6.4.1A, 6.4.3, 6.4.4 and 6.4.6. The requirement under Policy 6.4.7 to consider the need for a residual flow at the~~

~~point of take does apply to community water supplies, having regard also to the need to provide for human health and safety. Existing residual flow conditions may be confirmed or reviewed through the application of this Plan.~~

~~Community water supply takes beyond the primary allocation will be subject to Policy 6.4.9 or 6.4.10 and will need to be designed to maintain aquatic ecosystem values, while ensuring sufficient supply under low flow conditions so that human health and safety are not compromised. Section 14(3)(b) of the Resource Management Act provides for the unrestricted taking of water for an individual's reasonable domestic needs, provided the taking does not, or is unlikely to, have an adverse effect on the environment.~~

Principal reasons for adopting

This policy is adopted to enable continued unrestricted operation of Schedule 1B and 3B community water supplies. Human health and safety are dependent on a reasonable supply of water and imposing minimum flows on existing takes may compromise human health and safety unnecessarily. In many instances the community has made a considerable investment in developing infrastructure to supply water, and has undertaken significant development that is dependent on the water supply.

~~Consideration of any need for a residual flow at the point of take may be needed in some instances to provide for specific values of the source water body.~~

Rules: 12.1.3.1 and 12.2.2A.1

6.4.9 to 6.4.10 [*unchanged*]

Groundwater Takes

6.4.10A To enable the taking of groundwater by:

- (a) In each aquifer other than any in Schedule 2C or within 100 metres of a connected perennial surface water body, defining a quantity known as the *maximum allocation volume*, which is:**
 - (i) For aquifers in Schedule 4A, the greater of:**
 - (1) A limit specified as the maximum allocation volume in Schedule 4A; or**
 - (2) The sum of assessed ~~consented~~ maximum annual take for that aquifer at 10 April 2010, less any quantity in a consent where:**
 - (A) All of the water taken is immediately returned to the aquifer or connected surface water body;**
 - (B) The consent has been surrendered or has expired (except where the quantity has been granted to the existing consent holder as a new consent;**

- (C) The consent has been cancelled (except where the quantity has been transferred to a new consent under Section 136(5));
- (D) The consent has lapsed;
- (ii) For aquifers other than those in Schedule 4A, the greater of:
 - (1) A limit which is 50%⁽²⁾ of the calculated mean annual recharge; or
 - (2) The sum of maximum annual take for that aquifer at 10 April 2010, less any quantity in a consent where:
 - (A) All of the water taken is immediately returned to the aquifer or connected surface water body;
 - (B) The consent has been surrendered or has expired (except where the quantity has been granted to the existing consent holder as a new consent);
 - (C) The consent has been cancelled (except where the quantity has been transferred to a new consent under Section 136(5));
 - (D) The consent has lapsed; and
- (b) In an aquifer other than any in Schedule 2C or within 100 metres of a connected perennial surface water body, applying aquifer restriction levels where specified in Schedule 4B; and
- (c) In any aquifer, avoiding contamination of groundwater or surface water; and
- (d) In any aquifer, avoiding permanent aquifer compression.

Explanation

Policy 6.4.1A(a) and (b) provide for the management of connected groundwater as if it were surface water. All water allocated as groundwater in terms of Policy 6.4.1A(c) or (d) needs to be managed for the protection of aquifers and the maintenance of any long term outflows. The outflows from any aquifer need to be maintained to prevent long term depletion of base flow to surface water bodies and prevent seawater intrusion.

Sustainable allocation of groundwater will be achieved by considering as restricted discretionary activities, those applications where:

- (i) The individual take would not cause the cumulative take from the aquifer to exceed 50%⁽²⁾ of the mean annual recharge of the aquifer, or the maximum allocation volume listed in Schedule 4A, unless that take was the subject of a resource consent granted before 10 April 2010; and
- (ii) Relevant aquifer restriction levels are met; and
- (iii) Aquifer contamination or compression will be avoided.

For some aquifers identified in Maps C1–C17, maximum allocation volumes are specified in Schedule 4A, where there is sufficient information to set them. Maximum allocation volumes are appropriate for

² The figure of 50% is subject to appeal by the Director-General of Conservation under proposed plan change 1C.

managing the cumulative effects of groundwater takes on long term storage of an aquifer and on outflows to surface water bodies. Matters that will be considered when setting maximum allocation volumes are given in Schedule 4C.1. Significant drawdown effects are addressed under (b) of this policy.

Allocation is available when the ~~assessed consented~~ assessed maximum annual take is below the limits specified in (a)(i)(1) or (a)(ii)(1) of this policy. Where the ~~assessed consented~~ assessed maximum annual take reduces below those limits, through surrender, lapse, cancellation or non-replacement on expiry of existing consents, new quantities may be granted. The assessed maximum annual take is calculated using the process outlined in Method 15.8.3.1.

When an existing consent holder applies for a new consent for the same activity, and is able to continue to lawfully exercise the consent under Section 124, that quantity of water retains its status within maximum allocation volume and may be granted to the new consent. Only where the application is approved does the quantity remain within maximum allocation volume.

Note that where the quantity from an existing consent within maximum allocation volume is transferred to a new consent, calculation of the maximum allocation volume in (a)(i)(2) and (a)(ii)(2) of this policy is based on the quantity specified in the new consent.

When the aquifer levels specified in Schedule 4B are reached, the actual taking of water will be restricted as provided for in the Schedule. Restrictions will apply to all consents to take groundwater under Policy 6.4.1A(c) or (d), including those for community water supply specified in Schedule 3B, as well as permitted taking in accordance with Rule 12.2.2.2. Maps D1–D4 show the Schedule 4B aquifers to which the restrictions apply.

When considering the taking of any groundwater, the adverse effects identified in (c) and (d) of this policy must be avoided.

Principal reasons for adopting

This policy is adopted to ensure that potentially long term or irreversible adverse effects on aquifer properties resulting from taking groundwater are avoided. It is important to achieve this outcome in order to provide for the needs of Otago's present and future generations.

This policy also maintains levels and pressures within identified aquifers. This will assist in achieving the environmental results detailed in Schedule 4B, by avoiding significant reductions.

This policy allows for sustainable taking of groundwater from aquifers, where the take will not have a direct effect on any surface water body, while avoiding adverse effects, including in particular the matters listed in

Policies 5.4.2 and 5.4.3. Allocating no more than the limits in the policy ensures the remaining groundwater provides for adequate levels of system outflow.

6.4.10AB To define restriction levels where needed to protect aquifer properties and water storage.

Explanation

Groundwater restriction levels can be useful for protecting an aquifer from over-depletion due to extended periods of low recharge, or in managing localised areas of high demand. They can assist in avoiding land subsidence, aquifer compression, and reduced outflows to surface water. Near the coast or contaminated sites restrictions can minimise the potential for water quality effects by intrusion.

Restriction levels are listed in Schedule 4B, and new aquifers may be added to the schedule using the plan change process. Schedule 4C.2 provides detail of the matters that may be considered when setting restriction levels.

Principal reasons for adopting

This policy is adopted to enable the taking of groundwater while assisting to maintain groundwater levels and water storage, water quality, aquifer interaction with other water bodies, and avoiding aquifer compression.

6.4.10AC To avoid aquifer contamination by:

- (a) Recognising contaminated sites;**
- (b) Identifying areas vulnerable to seawater intrusion;**
- (c) Setting maximum allocation volumes;**
- (d) Setting aquifer restriction levels;**
- (e) Restricting takes; and**
- (f) Requiring monitoring of groundwater quality and levels.**

Explanation

Lowering groundwater levels through takes near contaminated sites can result in contamination spreading into the aquifer. When groundwater levels are lowered near the coast seawater can intrude inland, and where aquifers are known to be at risk they are identified as “seawater intrusion risk zones” on Maps C1-C17, however all groundwater takes near the coast present some risk.

The maximum allocation volume in Schedule 4A is set to reflect the water from recharge that is available for taking, while avoiding risk of contamination.

Where there is risk of aquifer contamination, the rate, volume, timing and frequency of take may be restricted, and groundwater levels monitored, to

control the degree to which groundwater levels are lowered. Groundwater quality monitoring may also be required.

Principal reasons for adopting

This policy is adopted to avoid seawater intrusion into aquifers near the coast, or migration of contaminants from contaminated sites, as a result of taking groundwater. If contaminated, the aquifer's range of uses would be restricted.

6.4.10B to 6.4.10C *[unchanged]*

6.4.10D to 6.4.10E *[minor and consequential change – see page 45]*

All Water Takes

6.4.11 to 6.4.21 *[unchanged]*

6.5 to 6.7 *[unchanged]*

9

Groundwater



9.1 Introduction *[unchanged]*

9.2 Issues

9.2.1 to 9.2.4 *[unchanged]*

9.2.5 **Over-use of poor quality groundwater for irrigation may degrade soil resources.**

Explanation

Groundwater in certain parts of Otago may be of poor quality. The groundwater of the Waiareka Volcanic Aquifer Tuff formation (within the western part of the North Otago Volcanic Aquifer), for example, is naturally saline high in sodium. There is potential for long term degradation of soil health through application of this water for irrigation. While the affected communities are usually aware of this problem and are taking measures to address it, there is a need to evaluate the potential for soil degradation in the granting of any consent to use groundwater for irrigation purposes.

9.3 Objectives *[unchanged]*

9.4 Policies

9.4.1 to 9.4.21 *[unchanged]*

~~9.4.22 **In granting resource consents to take water from any aquifer, or in any review of the conditions of a resource consent to take water from any aquifer, where appropriate to require groundwater quality to be monitored.**~~

~~**Explanation**~~

~~It may be appropriate to require that the quality of groundwater taken from bores be monitored to provide data to determine changes in water quality in the aquifer. These changes may signal the need for management of water takes from the aquifer or land use over parts of aquifers which are vulnerable to leachate contamination.~~

~~**Principal reasons for adopting**~~

~~This policy is adopted to provide better information on the quality of the groundwater where that is necessary and appropriate.~~

9.4.23 To support the voluntary efforts of landholders in their management of the effects of poor quality groundwater on irrigated soils.

Explanation

Communities using groundwater for irrigation need to be aware of the potential for soil degradation where that water is of poor quality, and manage their irrigation accordingly. ~~The Otago Regional Council currently supports users of Papakaio and Waiareka Volcanic Aquifer groundwater, in their management of irrigation, through the provision of information and technical support where necessary, and will take the same approach where similar problems arise elsewhere in the region.~~

Principal reasons for adopting

This policy is adopted to ensure appropriate action is taken to avoid reduction of the productive capacity of soil resources for present and future generations, resulting from irrigation using poor quality groundwater.

9.5 Anticipated environmental results *[unchanged]*

12

Rules: Water Take, Use and Management



12.0 to 12.1 [*unchanged*]

12.2 The taking and use of groundwater

12.2.1 Prohibited activities: No resource consent will be granted [*unchanged*]

12.2.2 Permitted activities: No resource consent required

12.2.2.0 [*unchanged*]

12.2.2.1 The taking and use of groundwater for domestic needs or the needs of animals for drinking water is a *permitted* activity providing:

- (a) ~~No~~ no take is for a volume greater than ~~10,000~~ 25,000 litres per day; and
- (b) ~~No take is at a rate greater than 1.5 litres per second; and~~
- (c) ~~The~~ the taking or use does not have an adverse effect on the environment.

12.2.2.2 Except as provided for by Rules 12.2.1.1 to 12.2.2.1, the taking and use of groundwater is a *permitted* activity, providing:

- (a) No lawful take of water is adversely affected as a result of the taking; and
- (aa) The water is not taken from any aquifer identified in Schedule 2C; and
- (ab) The water is not taken from within 100 metres of any wetland, lake or river; and
- (b) [*Repealed*] ~~The take is for a rate no greater than 1.5 l/s, and a volume no greater than 10,000 litres per day, at any landholding, from the following aquifers:~~
 - (i) ~~[Repealed]~~
 - (ii) ~~[Repealed]~~
 - (iii) ~~Roxburgh Basin (as identified on Map C12);~~
 - (iv) ~~Manuherikia Claybound (as identified on Map C4);~~
 - (v) ~~Dunstan Flats Groundwater Zone B (as identified on Map C4);~~
 - (vi) ~~Manuherikia Alluvium (as identified on Map C4); and~~
 - (vii) ~~Wakatipu Basin (as identified on Map C2); and~~
- (c) [*Repealed*] ~~The take is for a rate no greater than 2.5 l/s, and a volume no greater than 30,000 litres per day, at any landholding, from the following aquifers:~~
 - (i) ~~Lower Waitaki Plains Groundwater Protection Zone B (as identified on Map C9);~~
 - (ii) ~~Lower Taieri (as identified on Map C15);~~
 - (iii) ~~Kuriwao Basin (as identified on Map C16);~~
 - (iv) ~~Pomahaka Basin (as identified on Maps C13 and C14);~~
 - (v) ~~Earnsclough Terrace (as identified on Map C4);~~

- ~~(vi) Dunstan Flats Groundwater Zone A (as identified on Map C4);~~
- ~~(vii) Maniototo Tertiary (as identified on Maps C5-C8);~~
- ~~(viii) Cromwell Terrace (as identified on Map C3);~~
- ~~(ix) Hawea Basin (as identified on Map C1);~~
- ~~(x) Wanaka Basin Cardrona Gravel (as identified on Map C1);~~
- ~~(xi) Papakaio (as identified on Map D1); and~~
- (d) The take is for a rate no greater than 3.5 l/s, and a volume no greater than 50,000 litres per day, at any landholding, from the following aquifers:
 - (i) Lower Waitaki Plains Groundwater Protection Zone A (as identified on Map C9); and
 - (ii) Inch Clutha Gravel (as identified on Map C17); and
- (e) Except as provided by Conditions ~~(b) to~~ (d) above, the take is for a rate no greater than 1.5 l/s, and a volume no greater than 25,000 litres per day, at any landholding, elsewhere in Otago; and
- (f) No back-flow of any contaminated water occurs to the aquifer; and
- (g) The taking of groundwater is not suspended.

The Otago Regional Council may, by public notice, suspend the taking of water under this rule if the taking of water, under a resource consent has had to cease in accordance with Rule 12.2.3.5, for the aquifer from which the taking of water under this rule is occurring.

12.2.2.3 The taking of groundwater for the purpose of down-hole pump testing is a **permitted** activity, providing:

- (a) The take does not exceed ~~20 litres per second~~ 2,000,000 litres per day and is carried out for a period of no longer than three consecutive days; and
- (b) No lawful take of water is adversely affected as a result of the taking.

12.2.2.4 to 12.2.2.6 [*unchanged*]

12.2.2.A Controlled activity: Consent required but always granted

12.2.2.A.1 The taking and use of groundwater for community water supply, up to any volume or rate authorised as at 28 February 1998, by any take identified in Schedule 3B is a **controlled** activity.

In granting any resource consent for the taking and use of groundwater in terms of this rule, the Otago Regional Council will restrict the exercise of its control to the following:

- (a) The need to observe a restriction level; and
- ~~(ab) Any~~ The need for a residual flow at the point of take; and

- (~~aac~~) The rate, volume, timing and frequency of the water to be taken and used; and
- (~~bd~~) The quantity of water required to meet the needs of the community; and
- (~~bae~~) The proposed methods of take and delivery of the water taken; and
- (~~ef~~) The duration of the resource consent; and
- (~~dg~~) The information and monitoring requirements; and
- (~~eh~~) Any bond; and
- (~~fi~~) The review of conditions of the resource consent.

Applications may be considered without notification under Section 93 and without service under Section 94(1) of the Resource Management Act on persons who, in the opinion of the consent authority, may be adversely affected by the activity.

12.2.3 Restricted discretionary activities: Resource consent required

12.2.3.1 to 12.2.3.3 [*unchanged*]

12.2.3.4 Restricted discretionary activity considerations³

In considering any resource consent for the taking and use of groundwater in terms of Rule 12.2.3.2A, the Otago Regional Council will restrict the exercise of its discretion to the following:

- (a) The maximum allocation volume for the aquifer; and
- (b) The mean annual recharge of that aquifer; and
- (c) The effect of the take on the physical properties of the aquifer; and
 - (i) The rate, volume, timing and frequency of groundwater to be taken and used; and
 - (ii) The proposed methods of take, delivery and application of the groundwater taken; and
 - (iii) The source of groundwater available to be taken; and
 - (iv) The location of the use of the groundwater, when it will be taken out of a local catchment; and
 - (v) Any arrangement for cooperation with other takers or users; and
 - (vi) Any water storage facility available for the groundwater taken, and its capacity; and
 - (vii) In the case of takes from an aquifer identified in Schedule 4B, the restriction levels for the aquifer (as identified in that schedule) to be applied to the take of groundwater, if consent is granted; and
 - (viii) Any adverse effect on any lawful take of water, if consent is granted, including potential bore interference; and

³ Note that the Director-General of Conservation has appealed Rule 12.2.3.4, seeking inclusion of an additional discretion.

- (ix) Any actual or potential effects on any surface water body; and
- (x) Whether any part of the take would constitute allocation from any connected perennial surface water body, and the availability of that allocation; and
- (xi) The consent being exercised or suspended in accordance with any Council approved rationing regime; and
- (xii) Any adverse effect on the existing quality of groundwater in the aquifer; and
- (xiii) Any adverse effect on a significant wetland value identified in Schedule 9 or any wetland higher than 800 metres above sea level; and
- (xiv) Any financial contribution for Type B wetland values that are adversely affected; and
- (xv) The duration of the resource consent; and
- (xvi) The information, monitoring and metering requirements; and
- (xvii) Any bond; and
- (xviii) The review of conditions of the resource consent; and
- (xix) For resource consents in the Waitaki Catchment the matters in (i) to (xxi) above, as well as matters in Policies 6.6A.1 to 6.6A.6; and
- (xx) Whether the taking of water under a water permit should be restricted to allow the exercise of another water permit.

12.2.3.5 *[unchanged]*

12.2.4 to 12.2.5 *[unchanged]*

[Rest of chapter (Sections 12.3 to 12.13) remains unchanged]

15

Methods other than Rules



15.1 to 15.7 [unchanged]

15.8 Methods for calculating allocation and applying minimum flows

15.8.1 to 15.8.2 [unchanged]

15.8.3 Methodology for calculating assessed maximum annual take for groundwater

15.8.3.1 The assessed maximum annual take of groundwater from any aquifer for the purposes of Policy 6.4.10A(a), will be the sum of:

- (a) The annual volume specified on consents to take groundwater from that aquifer; and
- (b) Where a consent does not specify an annual volume, it is calculated using the instantaneous, daily, weekly or monthly limits specified as shown below:
 - (i) Except as provided for by (iii) below, where the purpose of use includes irrigation, convert the consent limit as follows:

(1) Where a daily or a monthly limit is specified:

<u>Consent Limit</u>	<u>Purpose of use irrigation</u>
<u>Daily</u>	<u>Multiply by 90</u>
<u>Monthly</u>	<u>Multiply by 6</u>

Note: A 90 day limit is equivalent to irrigating 150 days at 60% of the maximum take rate. A 6 month limit is representative of an annual irrigation season.

Where both limits are specified, use the limit which yields the smaller volume.

(2) Where no daily or monthly limit is specified:

<u>Consent Limit</u>	<u>Purpose of use irrigation</u>
<u>Instantaneous (e.g. litres/second or m³/hour)</u>	<u>Convert to a daily volume assuming taking of 12 hours per day, and then multiply by 90.</u>
<u>Weekly</u>	<u>Convert to a monthly volume, by multiplying by 4.3, and then multiplying by 6.</u>

Where both limits are specified, use the limit which yields the smaller volume.

(3) If a consent specifically restricts taking over different periods, use the quantity and time limits specified on the consent.

(ii) Where the only purpose of use is frost-fighting, convert any consent limit to a 20 day volume.

(iii) Except as provided for by (i) and (ii), convert the consent limit to a 12-month volume.

Principal reasons for adopting

This method is adopted to assess the annual volume of take from an aquifer, and so assist in determining the remaining allocation available from an aquifer.

15.9 *[unchanged]*

Schedules



SCHEDULE 3: HUMAN USE VALUES OF AQUIFERS

3. Schedule of human use values of Otago's aquifers *[minor and consequential change – see page 46]*

3A Schedule of human uses of particular aquifers *[unchanged]*

3B Schedule of groundwater takes for the purpose of community water supply

Site No.	Community Water Supply Takes (at NZMS 260 Series Map Grid Reference)
1*	Glenorchy Water Supply at E41:459-841.
2*	Arthurs Point Water Supply at E41:686-713.
3*	Dalefield Water Supply at F41:739-724.
4*	Arrowtown Water Supply at F41:806-773.
5*	Cromwell Water Supply at G41:119-671.
6*	Alexandra Water Supplies at: G42:253-444; G42:263-454; and G42:271-442
7*	Roxburgh Water Supply at G43:210132.
8*	Dunedin and Outram Water Supplies at: I44:956-803; I44:956-805; and I44:956-804.
9	Warrington Water Supplies at: I44:221-982; and I44:224-980
10*	East Taieri Water Supply at I44:007-763.
11*	Owaka Water Supply at H46:533-124.
12	Mosgiel Water Supply at: I44:048-789; I44:042-779; I44:036-776; I44:048-789; I44:036-788*; I44:051-787; I44:032-782; I44:051-789; and I44:042-784.
13*	Clydevale-Pomahaka Water Supply at G45:417-507; volume as at 28/2/98: 2082 m³/day.

* Point of take located within 100 metres of a surface water body.

SCHEDULE 4 : RESTRICTIONS ON THE EXERCISE
OF PERMITS TO TAKE GROUNDWATER

4. Schedule of specified restrictions on the exercise of permits to take groundwater

This schedule sets out restrictions that apply to the taking of groundwater from certain aquifers in Otago.

Schedule 4A identifies ~~annual~~ maximum allocation volumes for the taking of groundwater from aquifers identified in the C-series maps, in accordance with Policy 6.4.10A(a)(i) of this Plan. Schedule 4B identifies water levels at which the taking of groundwater will be restricted in accordance with Policy 6.4.10A(b) of this Plan. Schedule 4C identifies matters to be considered when making additions to these schedules through a plan change.

4A Maximum allocation volumes for groundwater takes from aquifers

Aquifer Name	Map Reference	Maximum Allocation Volume (million cubic metres per year)
North Otago Volcanic Aquifer	C10	5

4B Restriction levels for groundwater takes

Schedule 4B identifies water levels at which the taking of groundwater will be restricted, and identifies the nature of the restriction, in terms of a reduction in the take of water authorised by water permits, ~~and the objectives of the restrictions with their associated anticipated environmental results.~~

The aquifer maximum height refers to the historic record of the water level or pressure head after the recharge season. Note that the areas over which the restrictions apply are shown on Maps D1 - D4.

Aquifer See Maps D1– D4	Aquifer Reference Bore See Maps D1–D4	Aquifer maximum height (metres above datum)	Restriction levels (m above mean sea level)		
			25% restriction or response in terms of Council recognised rationing regime*	50% Restriction	100% restriction
North Otago Volcanic— Deborah	Websters Well	130.8	128.8 <u>126.0</u>	128.3 <u>125.5</u>	127.8 <u>125.0</u>
North Otago Volcanic— Waiareka	Isbister's Well	124.2	122.2	121.7	121.2
Lower Taieri – West	Momona Bore	101.24	100	99.5	99
Lower Taieri – East	Harleys Well, Piezo. 2	112.5	110.5	110.0	109.5
Ettrick Basin	Calder Bore	172.29	170.29	169.79	169.29
Roxburgh Basin (Coal Creek Terrace)	White-Hall Bore	185.5 <u>189.5</u>	184 <u>188</u>	183.75 <u>187.8</u>	183.5 <u>187.5</u>

SCHEDULE 4 : RESTRICTIONS ON THE EXERCISE
OF PERMITS TO TAKE GROUNDWATER

- * When the aquifer reaches this level there shall be either a 25% restriction or a water allocation committee, appointed by the Otago Regional Council, will implement a protocol to take all practical steps to curb the decline in the aquifer level so as to avoid a 50% restriction. If there is no water allocation committee or the water allocation committee does not use a protocol approved by the Council, the 25% water restriction will apply.

Aquifer	Management Objectives	Environmental Result
North Otago Volcanic— Deborah	Mean 30-day static pressure maintained to within 3.0 metres of mean sea level (Otago datum)	<ul style="list-style-type: none"> • Surface water flows (Awamoa and Waiareka Creeks particularly) are not adversely affected; • Bore interference is minimised; • Aquifer yield is maintained; • Risk of sea water intrusion is minimised.
North Otago Volcanic— Waiareka	Mean 30-day static pressure maintained to within 3.0 metres of mean sea level (Otago datum)	<ul style="list-style-type: none"> • Surface water flows (Awamoa and Waiareka Creeks particularly) are not adversely affected; • Bore interference is minimised; • Aquifer yield is maintained; • Risk of sea water intrusion is minimised.
Lower Taieri— West	Mean 30-day static pressure maintained to within 1.0 metres of mean sea level (Otago datum)	<ul style="list-style-type: none"> • Surface water flows are not adversely affected • Aquifer yield is maintained; • Bore interference is minimised; • Any risk of land subsidence and/or irreversible compression of the aquifer is avoided; • Any risk of sea water intrusion is minimised.
Lower Taieri— East	Mean 30-day static pressure maintained to within 3.0 metres of Aquifer Maximum	<ul style="list-style-type: none"> • Surface water flows (Silver Stream particularly) are not adversely affected; • Aquifer yield is maintained; • Bore interference is minimised; • Any risk of land subsidence and/or irreversible compression of the aquifer is avoided; • Any risk of sea water intrusion is minimised.
Ettrick Basin	Mean 30-day static water level maintained to within 3.0 metres of Aquifer Maximum	<ul style="list-style-type: none"> • Surface water flows (Benger Burn particularly) are not adversely affected; • Aquifer yield is maintained; • Bore interference is minimised.
Roxburgh Basin (Coal Creek Terrace)	Mean 7-day static water level maintained to within 2.0 metres of Aquifer Maximum	<ul style="list-style-type: none"> • Aquifer yield is maintained • Bore interference is minimised.

4C Schedule of matters to be considered when setting maximum allocation volumes and restriction levels for aquifers

Maximum allocation volumes and restriction levels for aquifers in Schedules 4A and 4B give effect to the objectives and policies in this Plan. Additional aquifers are added through the plan change process following scientific investigation and consultation with the community and affected parties. The lists in 4C.1 and 4C.2 identify matters to which consideration will be given when setting these volumes and levels. The lists are not exhaustive and consideration will be given to these and any other relevant matters. Restriction levels may not be needed for all aquifers.

4C.1 When setting maximum allocation volumes in Schedule 4A for an aquifer, consideration will be given to the following matters:

- (a) Physical properties of the aquifer;
- (b) The amount and characteristics of recharge to the aquifer;
- (c) Interaction with other aquifers;
- (d) Interaction with surface water bodies and their values;
- (e) The potential for contamination (including seawater intrusion);
- (f) The effects of taking groundwater on the aquifer (including results of computer modelling, where available);
- (g) Demand for water and existing water uses, including community water supplies;
- (h) Environmental, social, cultural, recreational and economic benefits of taking and using water; and
- (i) Any other relevant matter in giving effect to Part 2 of the Resource Management Act.

4C.2 When setting restriction levels in Schedule 4B for an aquifer, consideration will be given to the following matters:

- (a) Physical properties of the aquifer;
- (b) Variance of groundwater levels in the aquifer;
- (c) The amount and characteristics of recharge to the aquifer;
- (d) The proposed or existing maximum allocation volume;
- (e) Any actual or potential effect of drawdown on groundwater quality; and
- (f) The environmental, social, cultural and economic effects of the restriction level on existing users of groundwater from the aquifer.

Note: For aquifers not included in Schedule 4A, refer to Policy 6.4.10A for determining a maximum allocation volume.

Map C9 (*see attached map*)

- Show extended boundaries of the North Otago Volcanic Aquifer.
- Delete existing boundaries of the North Otago Volcanic Aquifer.
- Show the boundaries of the Papakaio Aquifer.

Map C9a (*see attached map*)

- Show the boundaries of the Papakaio Aquifer.
- Show extended boundaries of the North Otago Volcanic Aquifer.

Map C10 (*see attached map*)

- Show extended boundaries of the North Otago Volcanic Aquifer.
- Delete existing boundaries of the North Otago Volcanic Aquifer.
- Show “seawater intrusion risk zone” at Kakanui.
- Show the boundaries of the Papakaio Aquifer.

Map C10a (*see attached map*)

- Show extended boundaries of the North Otago Volcanic Aquifer.
- Delete existing boundaries of the North Otago Volcanic Aquifer.
- Show “seawater intrusion risk zone” at Kakanui.

Map D1 (*see attached maps*)

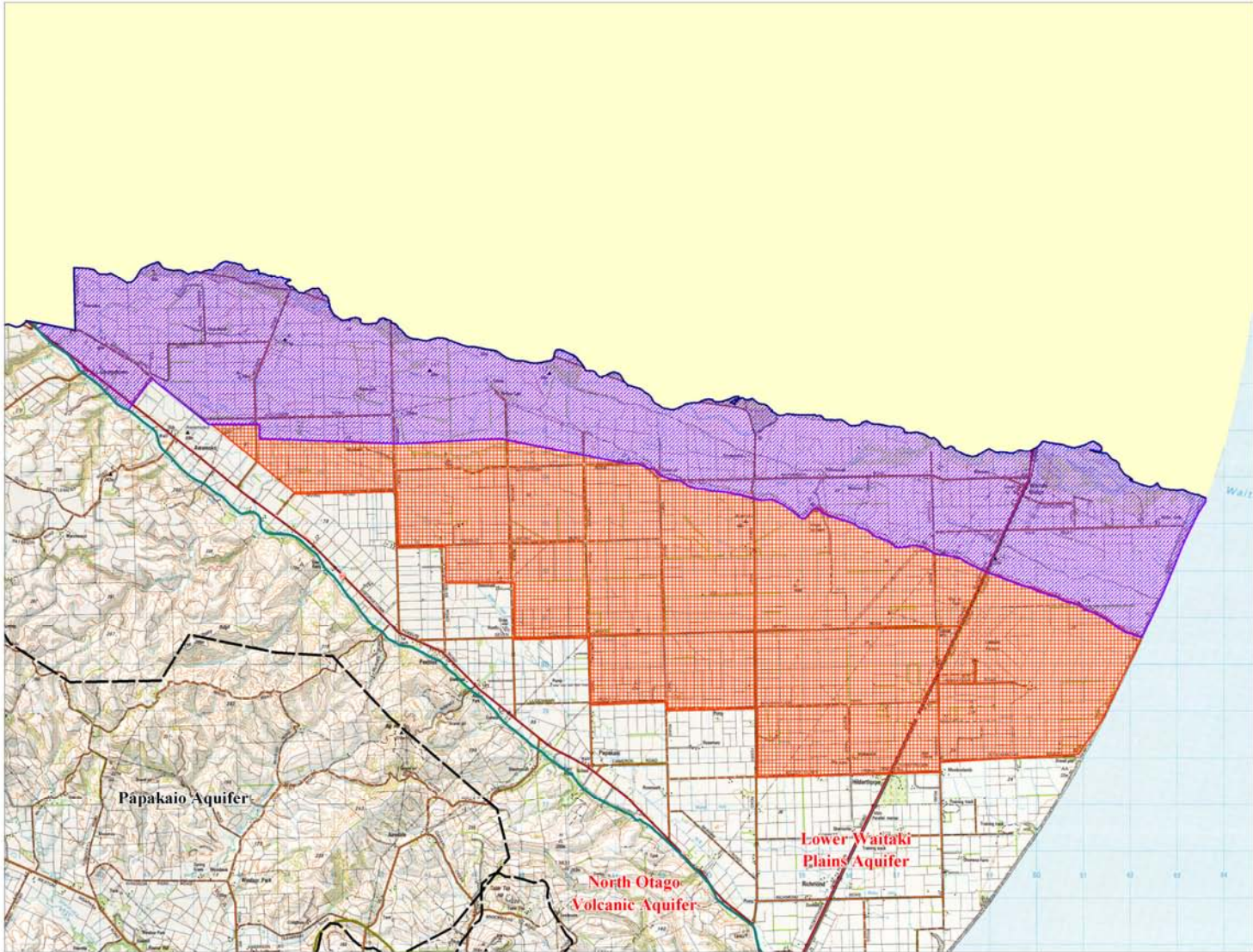
- Delete current Map D1 showing Papakaio Aquifer and “Enfield School Bore” in its entirety.
- Show extended boundaries of the North Otago Volcanic Aquifer.
- Delete existing boundaries of the North Otago Volcanic Aquifer.
- Delete reference to “Deborah” and “Waiareka” Aquifers.
- Delete “Isbisters Well”.

Map D2 (*see attached map*)

- Show extended boundaries of the North Otago Volcanic Aquifer.
- Delete existing boundaries of the North Otago Volcanic Aquifer.
- Delete reference to “Deborah” and “Waiareka” aquifers.
- Delete “Isbisters Well”.

M A P S

Lower Waitaki Plains, Papakaio and North Otago Volcanic Aquifers, and Groundwater Protection Zones



Map C9

Map not to scale

Proposed Plan Change 4A
(Groundwater and North Otago Volcanic Aquifer)
18 September 2010



Map Scale
1:75,000

Key

- Regional Boundary
- Aquifer Boundary
- Aquifer Boundary proposed for deletion
- - - Proposed Aquifer Boundary
- Groundwater Protection Zone A
- Groundwater Protection Zone B

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Key Map



Lower Waitaki Plains, Papakaio, North Otago Volcanic and Kakanui-Kauru Alluvium Aquifers, and Groundwater Protection Zones

Map not to scale

Map
C9a



Map Scale
1:75,000

Key

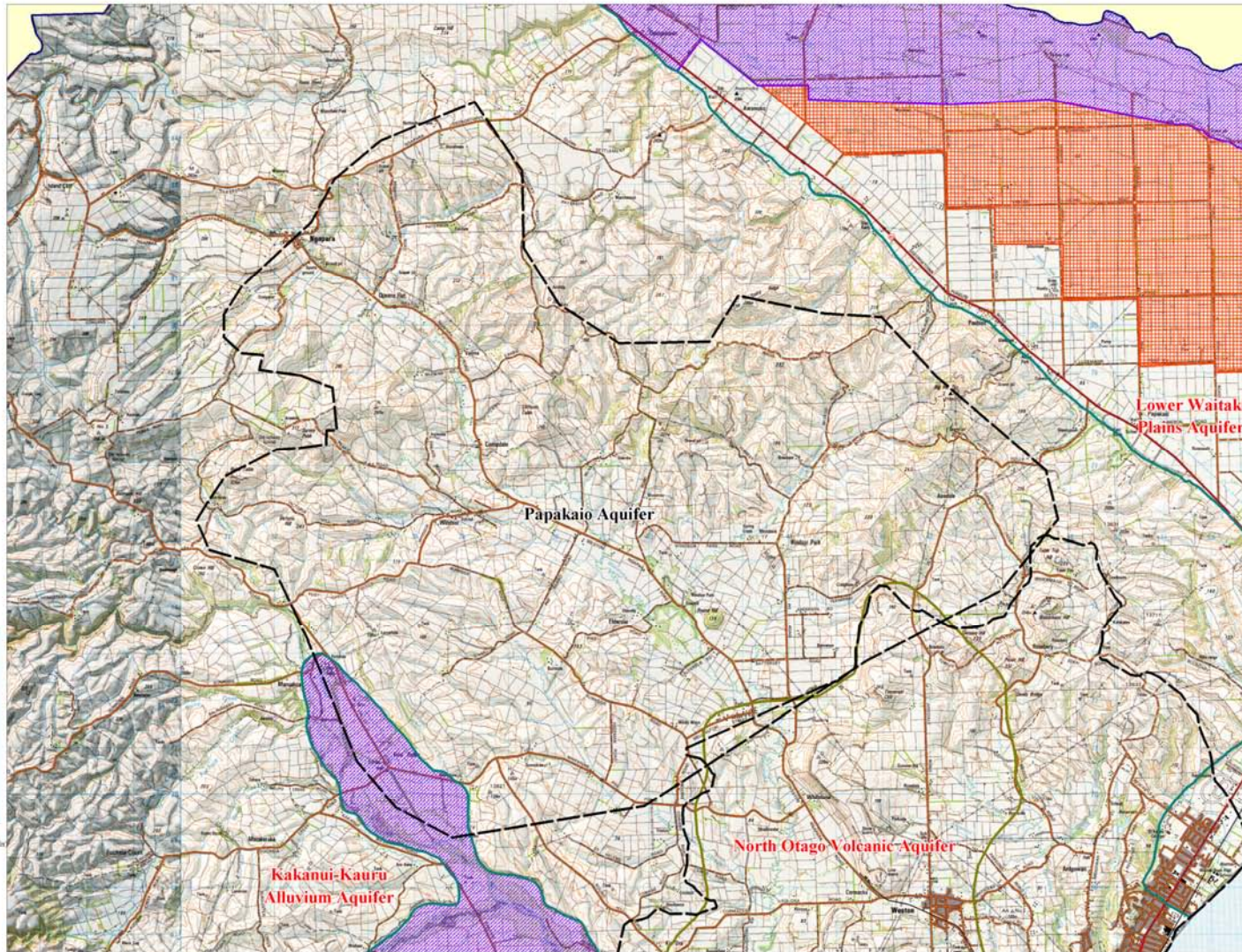
- Aquifer Boundary
- Aquifer Boundary proposed for deletion
- Proposed Aquifer Boundary
- Groundwater Protection Zone A
- Groundwater Protection Zone B

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Key Map



Proposed Plan Change 4A
Groundwater and North Otago Volcanic Aquifer
18 September 2010



Lower Waitaki Plains, Papakaio, North Otago Volcanic and Kakanui-Kauru Alluvium Aquifers,
Groundwater Protection Zones and Seawater Intrusion Risk Zone

Map not to scale

Map
C10



Map Scale
1:75,000

Key

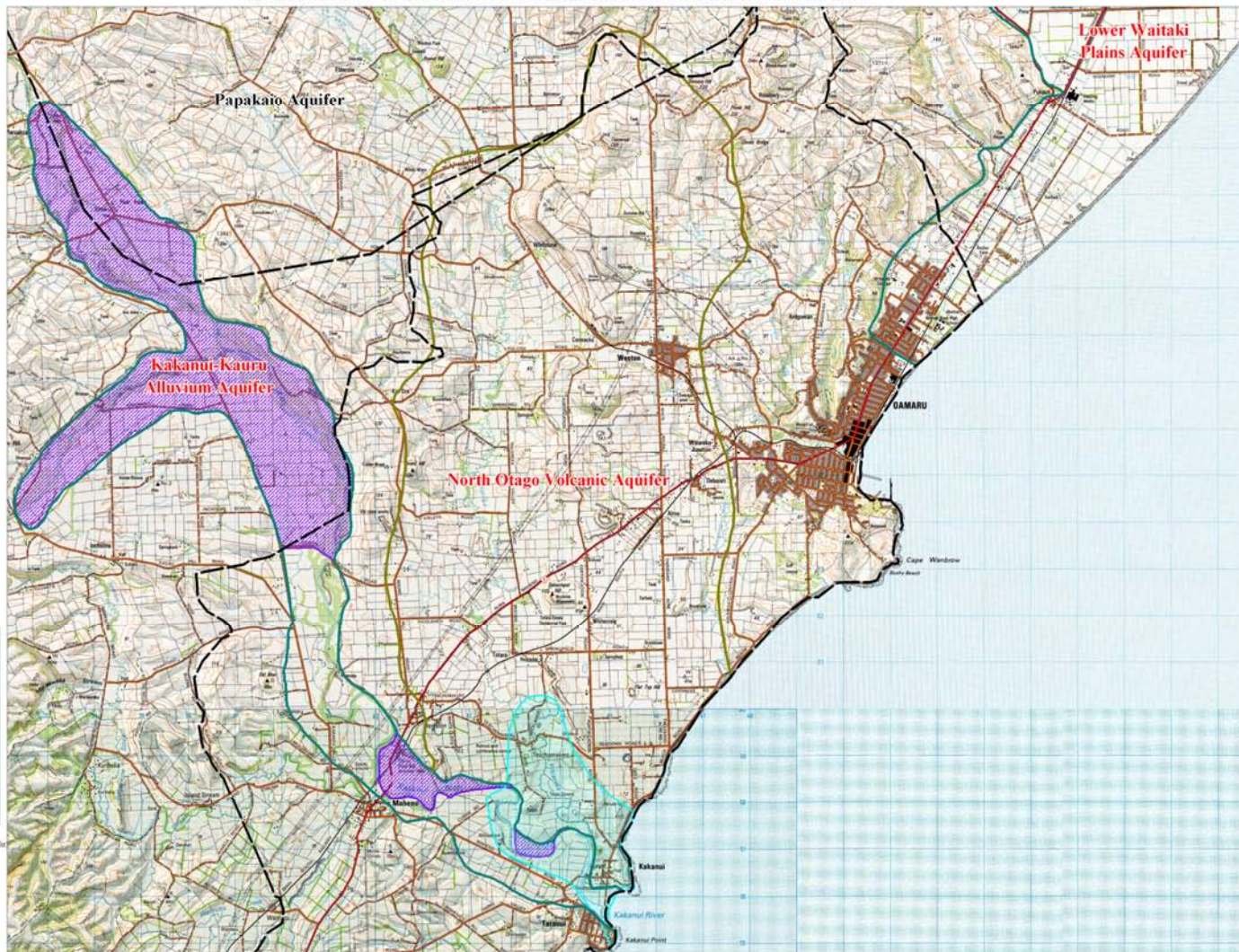
- Aquifer Boundary
- Aquifer Boundary proposed for deletion
- Proposed Aquifer Boundary
- Groundwater Protection Zone A
- Proposed Seawater Intrusion Risk Zone

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Key Map

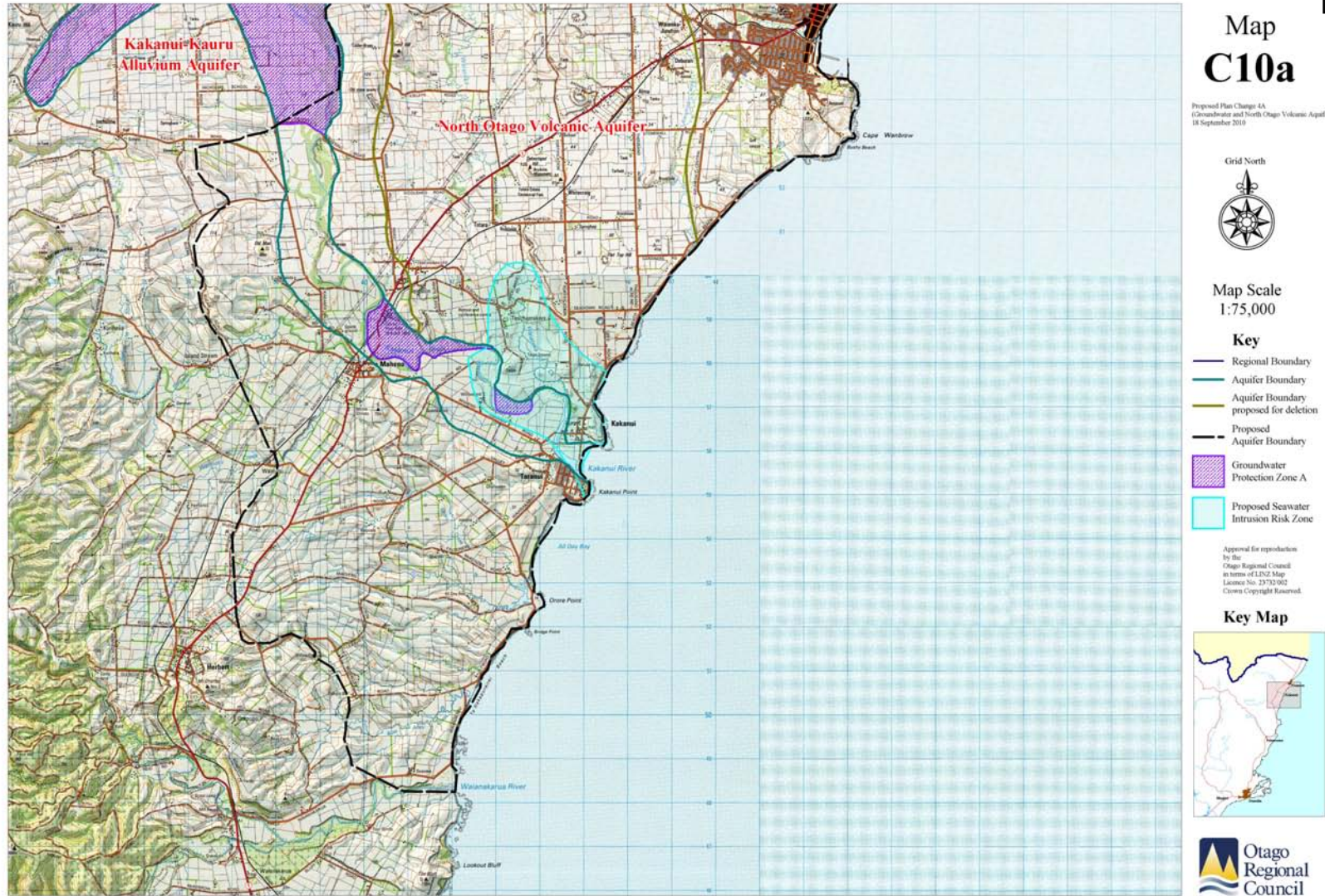


Proposed Plan Change 4A
Groundwater and North Otago Volcanic Aquifer
18 September 2010



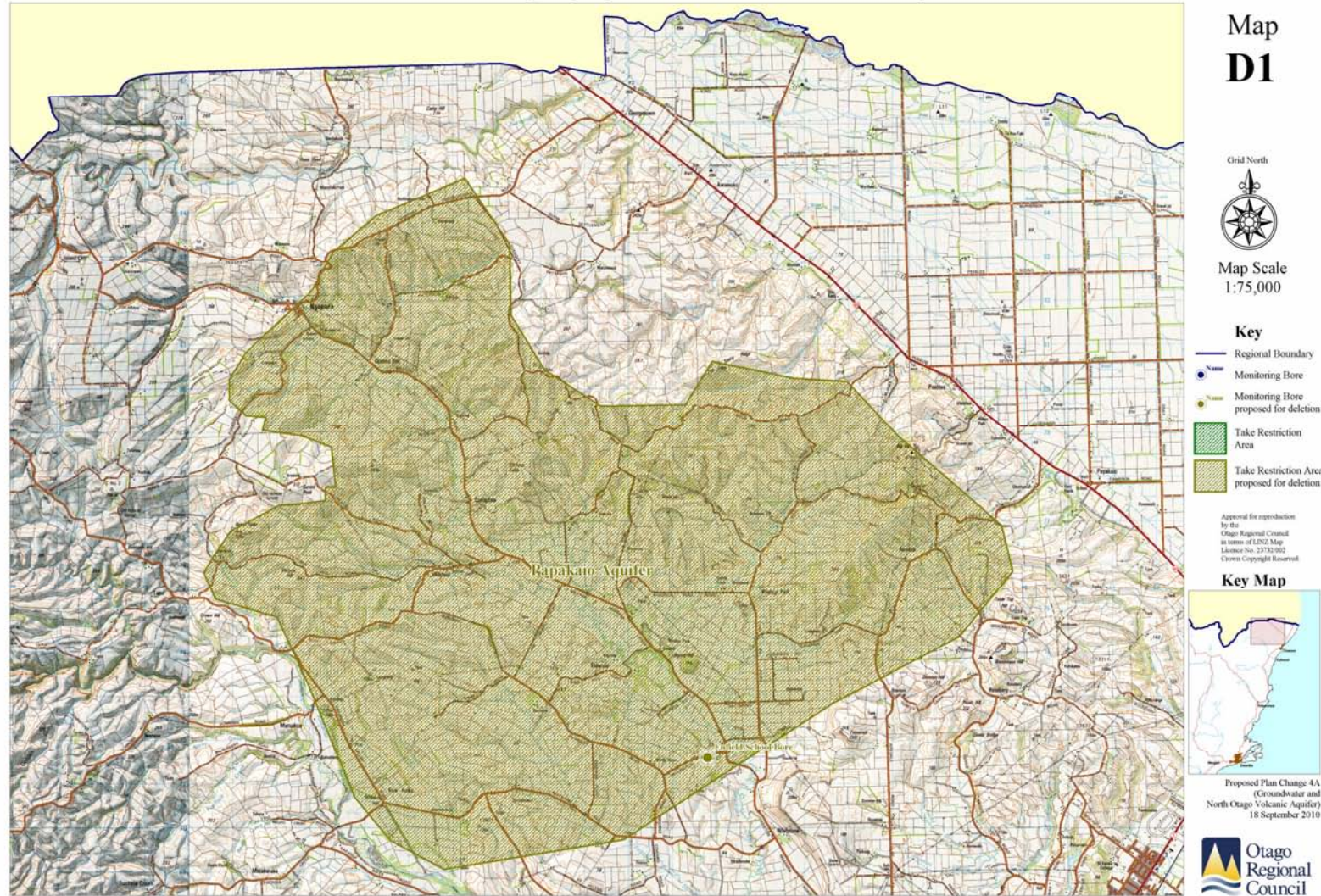
North Otago Volcanic and Kakanui-Kauru Alluvium Aquifers, Groundwater Protection Zones and Seawater Intrusion Risk Zone

Map not to scale



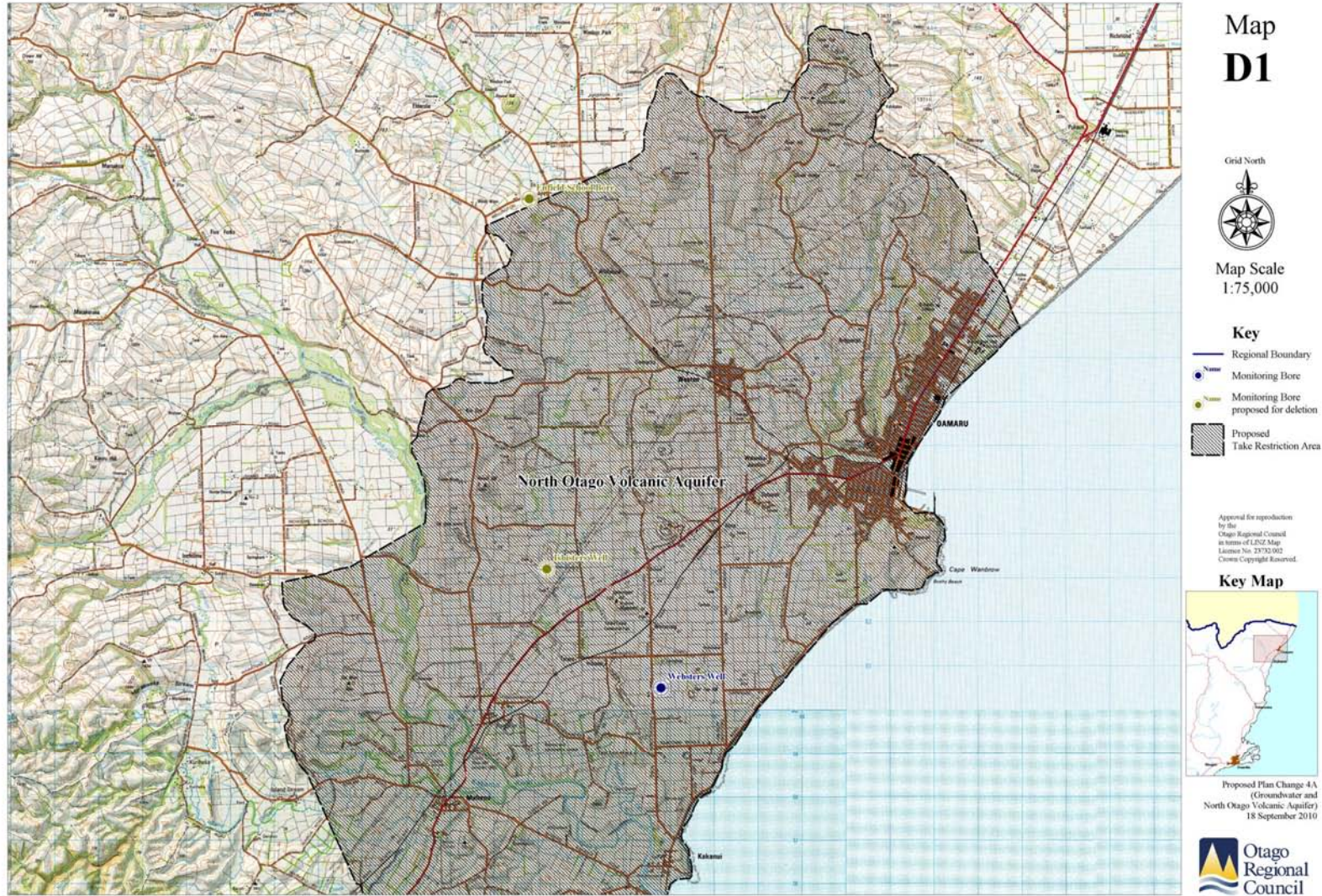
Monitoring Bore and Take Restriction Area of the Papakaio Aquifer
Note: This map is proposed to be deleted in its entirety.

Map not to scale



Monitoring Bore and Take Restriction Area of the North Otago Volcanic Aquifer

Map not to scale



Monitoring Bore and Take Restriction Area of the North Otago Volcanic Aquifer

Map not to scale

**Map
D2**



Map Scale
1:75,000

Key

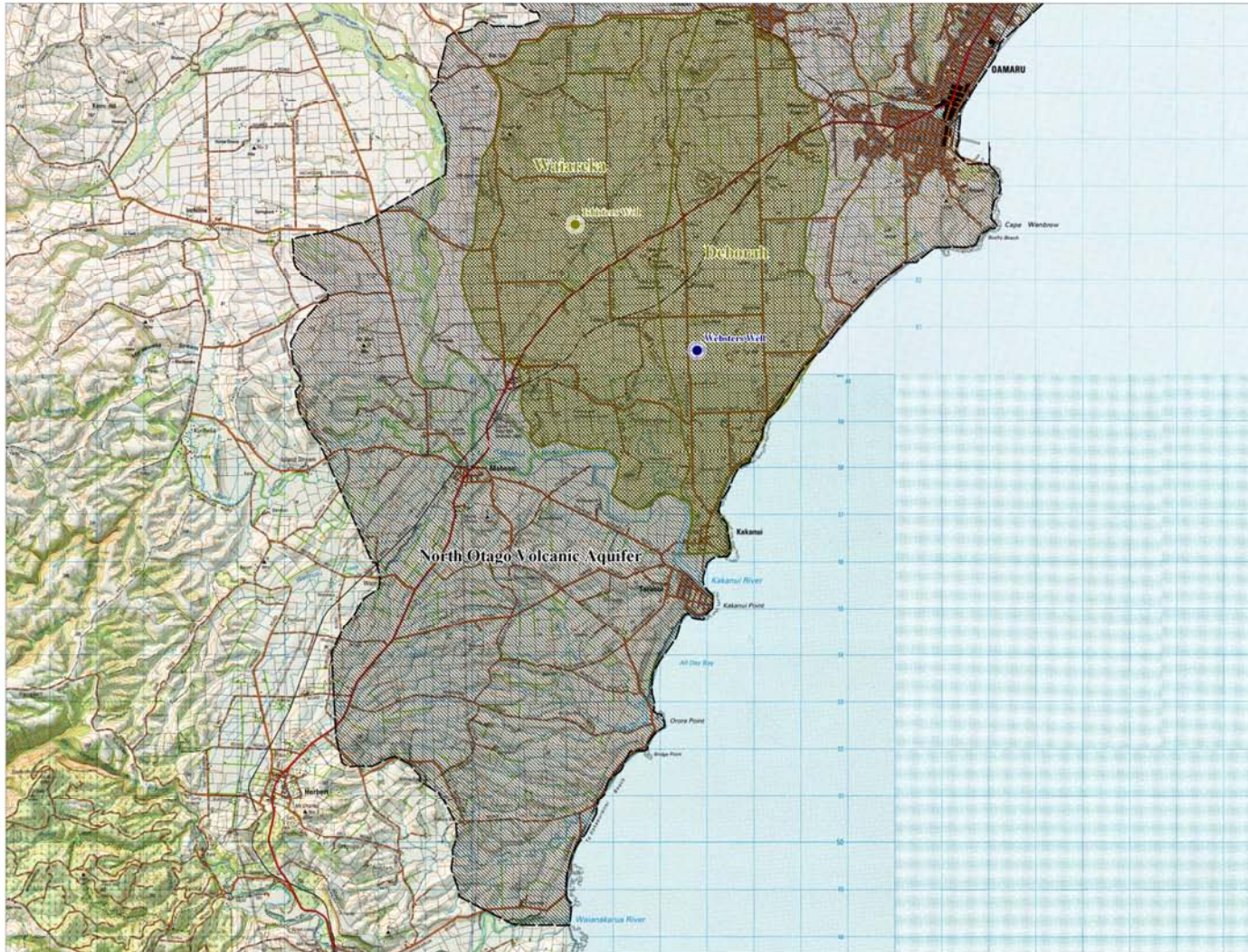
- Monitoring Bore
- Monitoring Bore proposed for deletion
- Take Restriction Area proposed for deletion
- Proposed Take Restriction Area

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Key Map



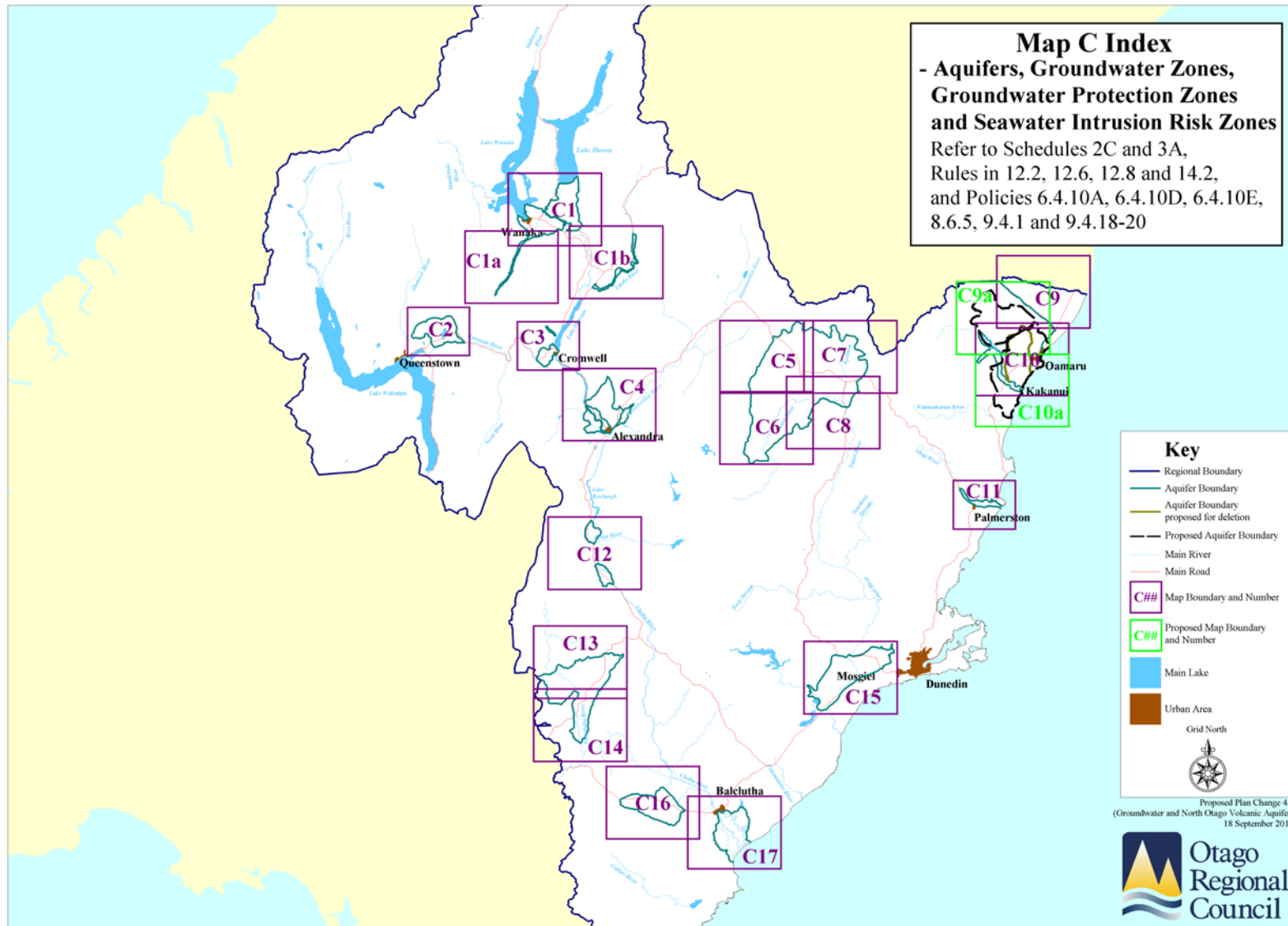
Proposed Plan Change 4A
(Groundwater and
North Otago Volcanic Aquifer)
18 September 2010



Plan Provision	Detail of proposed change								
Page numbers	Update page numbers.								
Footers	Change footer to read “Regional Plan: Water for Otago (Updated to <i><date to be inserted></i>)”.								
Title page	Change the date to read “Updated to <i><date to be inserted></i> ”.								
ISBN number	Obtain new ISBN numbers for Regional Plan: Water for Otago, and Regional Plan: Water for Otago Maps.								
Chronicle of key events	<p>Add the following to the end of table:</p> <table border="1"> <thead> <tr> <th>Key event</th> <th>Date notified</th> <th>Date decisions released</th> <th>Date operative</th> </tr> </thead> <tbody> <tr> <td>Plan Change 4A (Groundwater and North Otago Volcanic Aquifer) to the Regional Plan: Water</td> <td>18 September 2010</td> <td><i><Date to be inserted></i></td> <td><i><Date to be inserted></i></td> </tr> </tbody> </table>	Key event	Date notified	Date decisions released	Date operative	Plan Change 4A (Groundwater and North Otago Volcanic Aquifer) to the Regional Plan: Water	18 September 2010	<i><Date to be inserted></i>	<i><Date to be inserted></i>
Key event	Date notified	Date decisions released	Date operative						
Plan Change 4A (Groundwater and North Otago Volcanic Aquifer) to the Regional Plan: Water	18 September 2010	<i><Date to be inserted></i>	<i><Date to be inserted></i>						
Table of contents	Update page numbers.								
Table of contents	<p>Add the following:</p> <p><u>4C Schedule of matters to be considered when setting maximum allocation volumes and restriction levels for aquifers.</u></p>								
Section 3.3.1	<p>3.3.1 North Otago subregion</p> <p>...</p> <p>The subregion’s most highly used aquifers are:</p> <ul style="list-style-type: none"> • Lower Waitaki Plains Aquifer; • Papakaio Aquifer; • North Otago Volcanics Aquifer; • Kakanui-Kauru Alluvium Aquifer; and • Shag Alluvium Aquifer. 								
Index to policies in 6.4	<p>Add the following:</p> <p><u>6.4.10AB Aquifer restriction levels</u></p> <p><u>6.4.10AC Avoiding aquifer contamination</u></p>								
Policy 6.4.10D (Explanation)	... Map C15 shows the location of the Lower Taieri Aquifer. Map D1 C9a shows the Papakaio Aquifer.								
Policy 6.4.10E (Explanation)	... Map C15 shows the location of the Lower Taieri Aquifer. Map D1 C9a shows the Papakaio Aquifer.								

MINOR AND CONSEQUENTIAL CHANGES

Plan Provision	Detail of proposed change		
Rule 14.2.1.1	... (a) The drilling does not occur on land over an aquifer identified in Maps C1–C17 or the Papakaio Aquifer on Map D1; and		
Rule 14.2.2.1	The drilling of land over an aquifer identified in Maps C1–C17 or the Papakaio Aquifer on Map D1 , other than for the purpose of creating a bore and other than on the bed of any lake or river, is a <i>controlled</i> activity...		
Schedule 3	Schedule 3A identifies the uses of groundwater from particular aquifers in Otago. These aquifers are identified on Maps C9-C12, <u>and C15 and D1</u> .		
Glossary	<table border="1" style="width: 100%;"> <tr> <td style="width: 30%;">Annual renewable yield</td> <td>The amount of water that can be withdrawn annually from a groundwater basin or aquifer, without producing an adverse effect. Also known as “safe yield”, or “sustainable yield”.</td> </tr> </table>	Annual renewable yield	The amount of water that can be withdrawn annually from a groundwater basin or aquifer, without producing an adverse effect. Also known as “safe yield”, or “sustainable yield”.
Annual renewable yield	The amount of water that can be withdrawn annually from a groundwater basin or aquifer, without producing an adverse effect. Also known as “safe yield”, or “sustainable yield”.		
<u>Map A7</u>	<ul style="list-style-type: none"> ▪ <u>Delete groundwater community water supply take Site 9 (Warrington)</u> ▪ <u>Delete groundwater community water supply take Site 10 (East Taieri)</u> ▪ <u>Add groundwater community water supply take Sites 12 (Mosgiel)</u> 		
<u>Map A8</u>	<ul style="list-style-type: none"> ▪ <u>Add groundwater community water supply take Site 13 (Clydevale-Pomahaka)</u> 		
Map C index (attached):	<ul style="list-style-type: none"> ▪ Show locations of new Maps C9a and C10a, extended North Otago Volcanic Aquifer boundary, Papakaio Aquifer boundary. 		
Map D Index (attached)	<ul style="list-style-type: none"> ▪ Show extended North Otago Volcanic Aquifer boundary. ▪ Show deleted Papakaio Aquifer boundary. ▪ Show deleted Waiareka and Deborah Aquifer boundaries. ▪ Show relocation of Map D1. 		



Map not to scale

Map not to scale

