

REPORT

Assessment of Environmental Effects for Additional Bywashes: Landuse Consents



Prepared for

Central Plains Water Trust



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Section 1

Introduction

1.1 Purpose of this Report

This Assessment of Environmental Effects report (AEE) has been prepared to technically support a resource consent application by Central Plains Water Trust (the Applicant) to undertake the following activities:

- A Land use consent (bed) to erect, and maintain discharge structures and erosion protection works and to carry out associated excavation and disturbance, in, on, under, and over the bed of the Selwyn River and the Hawkins River at or about map reference NZMS 260 L35: 289-421 and NZMS 260 L35: 281-574.
- A land use consent to excavate and disturb land, deposit material, and remove and plant vegetation, associated with any operational or maintenance activity relating to the bywashes in the riparian margins of the Selwyn River and the Hawkins River at or about map reference NZMS 260 L35: 289-421 and NZMS 260 L35: 281-574.

The purpose of this report is to provide an assessment of the environmental effects of the proposed activities and explain what changes there will be within the natural, social, cultural and economic environment as a result of these activities. The scale and significance of these effects are reflected in the level of detail provided within the report. Measures to avoid, remedy or mitigate any potentially adverse effects of the proposal are also indicated.

This report has been prepared under the Resource Management Act 1991 (RMA); Section 88, "Making an Application" and the Fourth Schedule, "Assessment of Effects on the Environment". The report aims to present clear information on the consents applied for and the effects on the environment of the proposed activities.

1.2 Central Plains Water Enhancement Scheme

The area of the Central Plains Water Enhancement Scheme is located between the Rakaia and Waimakariri Rivers. Within this area it has been determined through scoping and feasibility studies that the possible scheme will involve the taking of water from three points, two on the Waimakariri River and another on the Rakaia River. Together these water takes will deliver water through a system of water races and channels, and with adequate storage will be able to irrigate an area of 60,000 ha, with a high level of reliability.

The key elements of the scheme as shown in Figure 1-1 include:

- An intake on the Waimakariri River above the confluence with the Kowai River and an inlet canal feeding water to the Waianiwiwa Reservoir via a tunnel through the Malvern Hills
- An intake on the Waimakariri River at the Gorge Bridge to bring water into the main headrace across the plains
- An intake on the Rakaia River approximately 8 km downstream of the Gorge Bridge to bring water into the main headrace across the plains
- A dam and consequent reservoir in the Waianiwiwa Valley to provide stored water that will discharge into the main headrace
- A level headrace that will run between the Rakaia and Waimakariri Rivers and deliver water to the distribution network
- A distribution network of water races down the plains providing water to all shareholder properties in the scheme area

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- Pump stations to lift water from the headrace and inlet canal to land that is too high to be supplied by gravity in the Windwhistle and Springfield areas
- Bywashes and wetlands at the downstream end of network races to discharge surplus water back into surface waterways or groundwater.

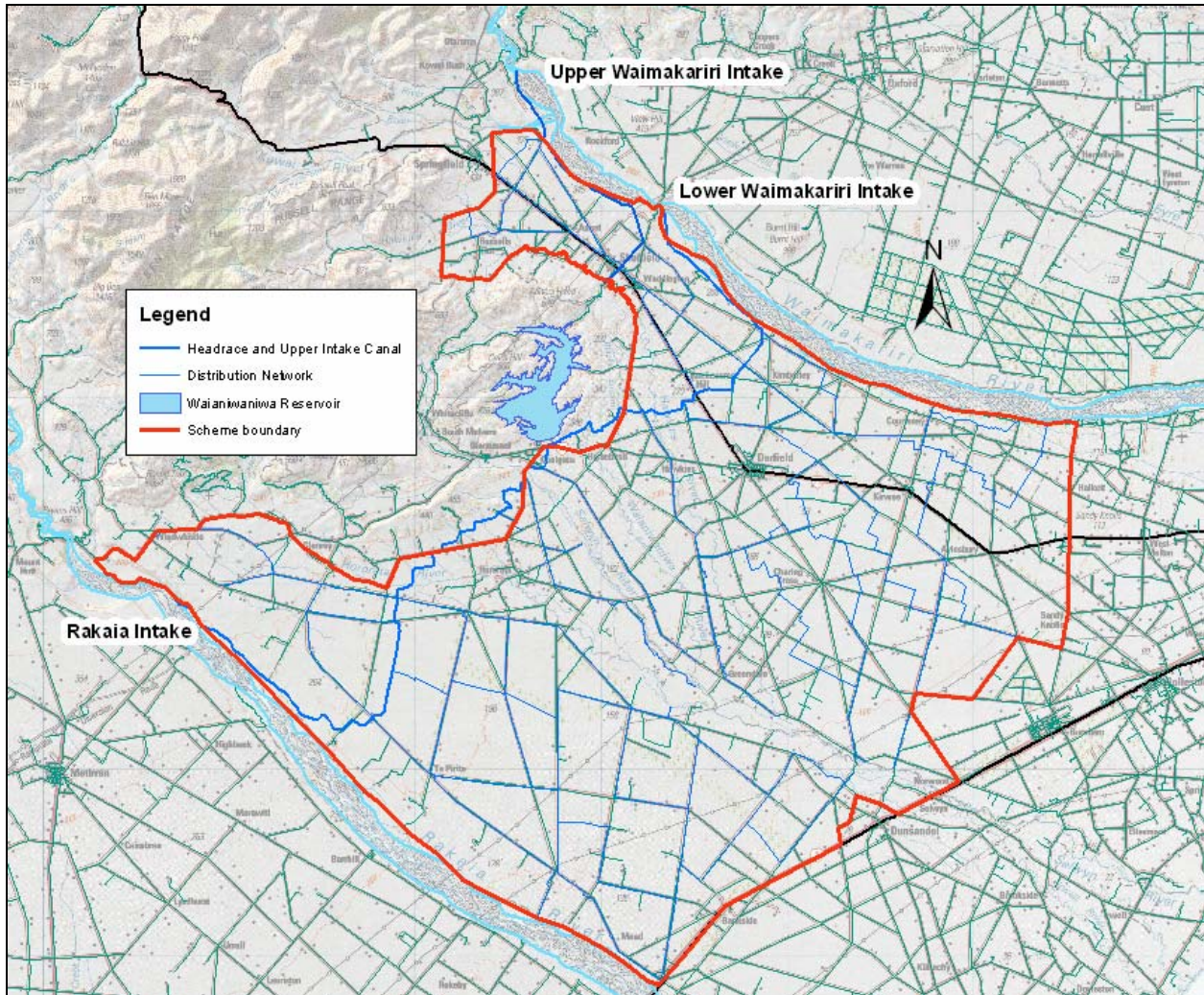


Figure 1-1 Central Plains Water Enhancement Scheme Layout

1.3 Background to the Scheme

For information on the scheme background refer to the overall scheme Assessment of Environmental Effects dated June 2006.

1.3.1 Previous Consent and Designation Applications Relating to the CPW Scheme

In December 2001, the Christchurch City Council, the Selwyn District Council and the Ashburton Community Water Trust (ACWT) jointly applied for resource consents for takes from the rivers. For the Rakaia River takes the applicants are commonly referred to as the Central Plains Water Enhancement Steering Committee (CPWE) and the ACWT. For the Waimakariri River take the applicants are the

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Christchurch City Council and Selwyn District Council acting as CPWE. The application, which is sought for a term of 35 years is for the following activities:

- A take of up to 40 m³/s of water from the Rakaia River at or about map reference NZMS 260 K36:050-393, for irrigation, and water enhancement.
- A take of up to 40 m³/s of water from the Rakaia River at or about map reference NZMS 260 K36:072-391, for irrigation, and water enhancement.
- A take up to 40 m³/s of water from the Waimakariri River, at or about map reference NZMS 260 L35:331-604, for irrigation and water enhancement.

The takes from the Rakaia River will be managed by the applicants through an integrated water management agreement, such that the combined take will not exceed 40 m³/s. Through this integrated approach to water management, CPWE and ACWT would share equal priority for the water abstraction, up to a combined maximum of 40 m³/s which would then not exceed the combined maximum abstraction limit under the National Water Conservation (Rakaia River) Order of 70 m³/s. This would further allow water not required by one scheme to be made available to the other for use. This application is referred to as CRC021091. This application number also originally covered the 2001 application to take 40 m³/s from the Waimakariri but subsequently this has been renumbered CRC061972 by the Regional Council.

Since lodging, the entities involved in these applications have changed. CPWE interests are now transferred to the Central Plains Water Trust (CPWT), which will obtain the resource consents and then licence them to Central Plains Water Ltd (CPWL), the entity which will exercise the consents.

In June 2005, the Central Plains Water Trust applied to take up to 40 m³/s of water from the Waimakariri River, anywhere within the map reference range (at or about) NZMS 260 L35:250-677 to NZMS 260 L35:245-690 for irrigation and water enhancement. This application effectively works in parallel with and should be heard with the original CRC021091 (now CRC061972), also an application to take up to 40 m³/s of water from the Waimakariri River, albeit at a different location (NZMS 260 L35:331-604). The effect of this application, when exercised at the same time as CRC021091 (now CRC061972), is that at any one time no more than 40 m³/s of water will be taken from the Waimakariri River.

In November 2005, the Trust lodged applications with the Canterbury Regional Council for an extensive suite of consents relating to the implementation of the scheme and for the use of the water that is the subject of the above applications. These applications were notified in June 2006, with submissions closing in August 2006. Details on these applications can be obtained from the Canterbury Regional Council or from the Central Plains web site (www.cpw.org.nz).

In June 2006, the Trust lodged applications for land use consents and served a notice of requirement on the Selwyn District Council relating to the implementation and operation of the scheme. These applications were notified by Selwyn District Council in November 2006 and were open for submissions until 29 January 2007. Details on the applications can be obtained from the Selwyn District Council or from the Central Plains web site.

In March 2007, the Trust lodged an application with the Canterbury Regional Council to construct and operate a ~10km long tunnel to carry water from the proposed upper intake on the Waimakariri River to the Waianiwiwa Reservoir. This application has not been notified yet.

1.4 Background to this Application

1.4.1 Previous Resource Consents Relating to this Application

In January 2007 the Trust lodged an application with the Canterbury Regional Council for the following activities:

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1. Discharge permit application to discharge operational bywash and emergency peak flow to land and water from the operation of the Central Plains Water Enhancement Scheme adjacent to the Selwyn River at or about map reference NZMS 260 L35: 289-421. **(CRC071916)**
2. Discharge permit application to discharge operational bywash and emergency peak flow to land and water from the operation of the Central Plains Water Enhancement Scheme adjacent to the Hawkins River at or about map reference NZMS 260 L35: 281-574. **(CRC071917)**

After some discussion, on the 5 March 2007 the applicant received a letter from Environment Canterbury which stated the following:

*No Landuse applications were made to accompany application **CRC071916** and **CRC071917**. For the purpose of consistency and considering all relevant necessary applications at the same time, we consider that it would be appropriate for Landuse applications relating to the discharge sites on the Hawkins and Selwyn River to be made.*

This application therefore seeks a Section 13 consent, as outlined in Section 1.4.2 below. This will allow all relevant and necessary applications to be heard at the same time.

In the above letter Environment Canterbury also stated the following:

In addition, it is noted that the wetland proposed to receive discharge water adjacent to the Hawkins River appears to be within 7.5 metres of the bed of the Hawkins River bed. Therefore, any works or planting associated with the formation of the wetland would require resource consent.

In response to this, the applicant seeks a landuse consent, as outlined in Section 1.4.2 below.

1.4.2 New Consents Sought

The proposed works as described in Section 2 of this AEE, require the following resource consents to proceed:

- A Land use consent (bed) to erect, and maintain discharge structures and erosion protection works and to carry out associated excavation and disturbance, in, on, under, and over the bed of the Selwyn River and the Hawkins River at or about map reference NZMS 260 L35: 289-421 and NZMS 260 L35: 281-574. A consent with a duration of 35 years is sought
- A land use consent to excavate and disturb land, deposit material, and remove and plant vegetation, associated with any operational or maintenance activity relating to the bywashes in the riparian margins of the Selwyn River and the Hawkins River at or about map reference NZMS 260 L35: 289-421 and NZMS 260 L35: 281-574. A consent with a duration of 35 years is sought

1.5 Structure of the Assessment of Environmental Effects

This Assessment of Environmental Effects (AEE) includes eight sections.

- Section 1.0** Introduction
- Section 2.0** The section provides a description of the proposed discharges.
- Section 3.0** Describes the alternative options to discharging into the wetlands and rivers.
- Section 4.0** Summarises the consultation process undertaken.
- Section 5.0** Provides a description of the environment.
- Section 6.0** Provides the assessment of environmental effects.
- Section 7.0** Discusses the mitigation measures proposed, including a section related to monitoring.

Section 1

Introduction

Section 8.0 Covers the planning aspects in terms of the RMA, and Regional Policies and Plans.

Section 2

Description of the Activity

For a general description of the scheme refer to Section 1.2 above, or for more details to the overall scheme Assessment of Environmental Effects dated June 2006. Details of the new discharges are included below.

2.1 Description of the Discharge Points

Discharge points are required at the lower end of the distribution network to discharge surplus flow. Such flow is generated by operational bywash and emergency peak flow conditions. Figure 2-1 shows the two new discharge locations, circled with red.

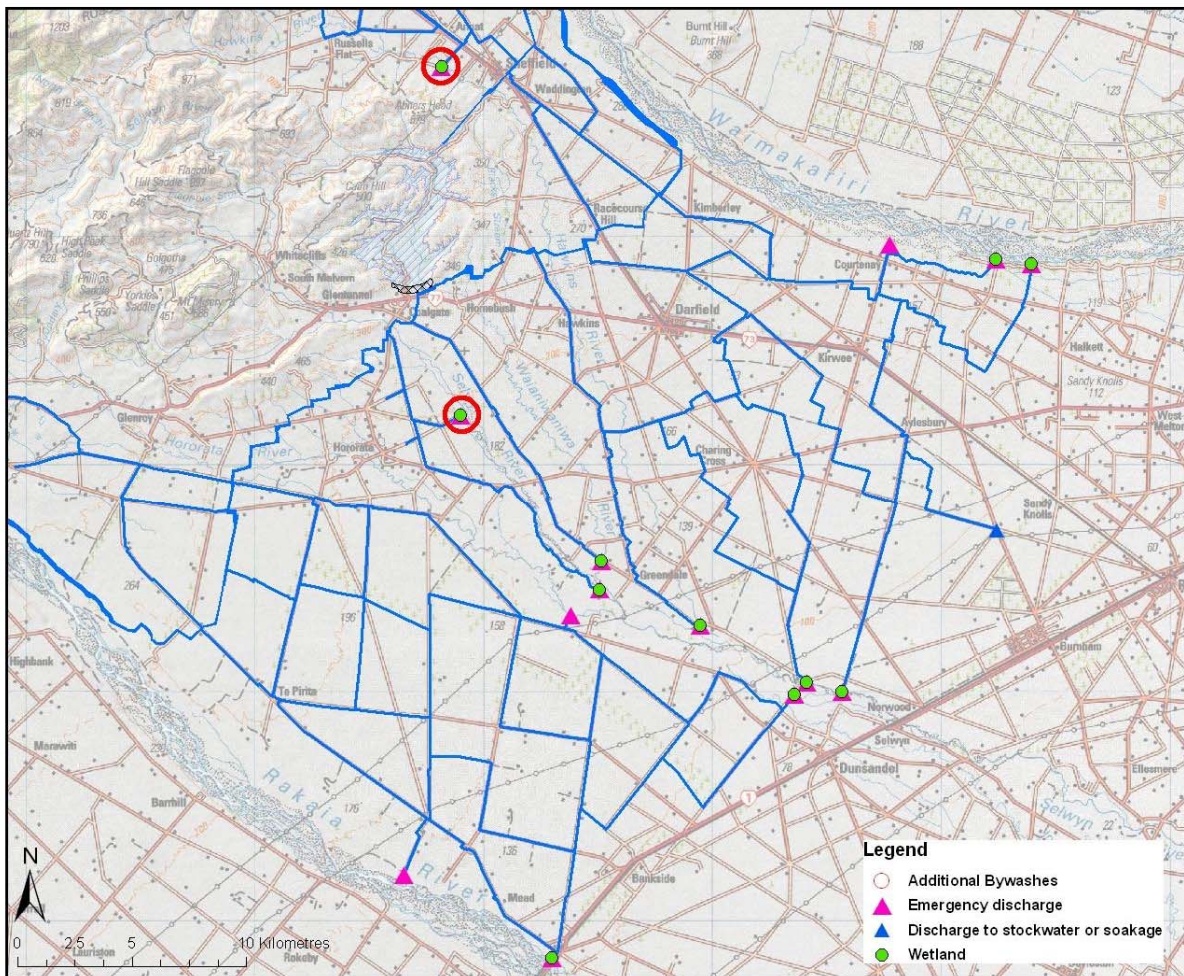


Figure 2-1 Discharge Locations and Wetlands

2.1.1 Operational bywash discharge

Under normal operations it will be necessary to discharge small volumes of surplus water at the end of the network branches. This is necessary to maintain flow past the last farmer taking scheme water on each race. This bywash will be minimised and in general discharged through ground soakage via constructed wetlands, to existing stockwater races (race D2.3), or into the headrace or reservoir inlet canal.

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Description of the Activity

The wetlands will be located adjacent to existing water courses but to prevent overflow they will not have any surface water connection. Soils in the wetland will be permeable enough to absorb water through the soil profile to the groundwater table.

The design parameters of the two new proposed bywash sites are outlined below, and the locations are shown in Figure 2-1. Figure 2-2 illustrates a wetland typical of the type proposed for these applications.

Selwyn River Bywash

Race C 3.1 will discharge bywash at a maximum rate of 0.4 m³/s to a 0.1 – 0.2 ha wetland at about map reference NZMS 260 L35: 289-421, adjacent to the Selwyn River.

Hawkins River Bywash

Race SP 2.5 will discharge bywash at a maximum rate of 0.3 m³/s to a 0.1 ha wetland at about map reference NZMS 260 L35: 281–574, adjacent to the Hawkins River.



Figure 2-2: Subsurface flow wetland, typical of that to be provided at operational bywash discharge points

2.1.2 Emergency peak flow discharge

At rare and brief times the full intake flow may have to be discharged. This could occur when there is a district-wide power cut when the canals were carrying full flow capacity, thus water can not be pumped out of the canals and has to be discharged. A sudden heavy rainfall could also cause irrigators to shut down their pumps before the intake race gates are closed. It is important to recognise that the full extent of the consents sought is for an extreme case that might never occur in the life of the scheme and, if it did, it would last for only a few hours.

As the wetlands can usually not take such flow rates without overflowing, other measures will be required to manage these situations. A risk analysis will be conducted with help from key stakeholders, including identifying the consequences of large surplus flows in relation to the variety of associated causes. A number of management measures will be investigated, including building a series of small storage weirs within the races, backup power supplies, or discharging to land. It is probable that none of these would need consenting. A fallback option, most likely as a full solution or perhaps as a partial solution in

Section 2

Description of the Activity

conjunction with other measures, would be to build larger bywashes that could accommodate in total the full flow of the canals. To do this, separate races would be constructed at the discharge locations to bypass the wetlands that take normal operational bywashes, and transport water to adjacent watercourses.

The design parameters of the two new proposed bywash sites are outlined below, and the locations are shown in Figure 2-1.

Selwyn River Bywash

Race C 3.1 is in the Hororata area, and will transport overflow water to the Selwyn River. The maximum flow will be 3 m³/s and the discharge location will be at about map reference NZMS 260 L35: 289–421, adjacent to the Selwyn River.

Hawkins River Bywash

Race SP 2.5 is in the Springfield area and will transport overflow water to the Selwyn River. The maximum flow will be 2.5 m³/s and the discharge location will be at about map reference NZMS 260 L35: 281–574, adjacent to the Hawkins River.

The activities described above will result in the need to erect and maintain discharge structures and erosion protection structures and to carry out associated bed excavation and disturbance in, on, under, and over the bed of the Selwyn River and the Hawkins River

Section 3

Alternatives

The Fourth Schedule of the RMA requires that where it is likely that an activity will result in any significant adverse effects on the environment, a description of any possible alternative locations or methods for undertaking the activity are provided. Whilst it is the conclusion of Section 6 of this report that the actual and potential adverse effects of the proposed works are minor, this section nonetheless discusses alternative methods and locations.

3.1 Discharge Directly to the River

An alternative to discharging the operational bywash water to a wetland would be to discharge this water directly to the river. Consultation with the local Maori established that discharge via a wetland was the preferred option. This may have the benefit of removing some contaminants before it reaches the waterway.

3.2 Discharge to land

Another alternative is to discharge to private land below the furthest downstream point of irrigation supply. This would have an impact on private land. It also needs to be kept in mind that wetlands in or adjacent to riverbeds are considered to be potentially desirable features and they belong more naturally at riverbed sites.

3.3 Emergency Discharge Points

Alternative details were described in Section 2.1.2 above. The alternatives are not considered to be a viable option for discharging the emergency flows. These flows are only expected to occur in rare situations such as during a power cut or heavy flooding and would last for only a few hours.

Removing the emergency discharge points would potentially result in flooding of surrounding properties and possibly roads.

It is noted that the options outlined above would still require the need for works and structures within the riverbed and riparian margins therefore, landuse consents would still need to be sought.

Section 4

Consultation

No specific consultation has been undertaken in regard to this application beyond the consultation which was undertaken for the original bywash AEE application of January 2007, CRC071918 and CRC071917.

For a detailed description of consultation undertaken for the whole scheme, refer to Scheme AEE dated 23 June 2006.

Section 5

Description of the Environment

For a general description of the environment refer to the overall scheme Assessment of Environmental Effects dated June 2006. Descriptions of the affected waterways are included below.

5.1 Selwyn River

The Selwyn River rises in the 1,600 m high Big Ben Range some 24 km northwest of Coalgate. It is fed by tributaries from the north slopes of the Harper Hills, and the central Malvern Hills, and has a catchment area above Coalgate of 235 km². Flow is monitored at Whitecliffs, 6.5 km west-northwest of Coalgate, and at Coes Ford near Leeston and summary flow statistics are shown in Table 6-3.

Downstream of Coalgate it flows out onto the Canterbury Plains and follows a 53 km long course southeast to Lake Ellesmere. It follows the junction of the coalescing alluvial fans built up by the Waimakariri and Rakaia Rivers, and for much of this distance it flows below ground except during floods. Permanent flow returns to the channel about 15 km from the lake. The Coes Ford monitoring station is 7.3 km from the lake.

Table 6-3: Summary flow statistics for Selwyn River

River (Site)	Catchment Area (km ²)	Flows (m ³ /s)		7 day low flow			Floods	
		Mean Flow	Mean Annual	10 yr return period	Mean Annual	10 yr return period		
Selwyn (Whitecliffs)	164	3.3	0.80	0.58	79	152		
Selwyn (Coes Ford)	678	3.3	0.63	0.31	156	338		

Source: <http://www.ecan.govt.nz/Our+Environment/Water/Rivers/RiverFlows/North-low-flow-statistics.htm> (accessed 21/10/05)

The scheme will affect the Selwyn River in a number of ways. The headrace will cross the channel near Coalgate via an embankment and siphon. Further downstream on the plains there will be a number of bywash wetlands within the scheme area. Outside of the scheme area there may be effects on the lower channel where increased groundwater flow may add to the discharge in the channel and increase the permanently wetted channel length.

5.2 Hawkins River

The Hawkins River rises in the 1,200 m high Russell Range, 10 km west of Springfield, and receives tributaries from the north slopes of the east and north Malvern Hills. The catchment area above Sheffield is ~ 120 km², and it flows a further 27 km south from here to join the Selwyn River. As with the other foothills rivers, it is dry through much of its course for most of the year.

The scheme affects the Hawkins River where the canal from the upper Waimakariri River intake crosses the river at Sheffield. There will be a short section of embankment and a siphon beneath the channel. There will also be a bywash discharge point near Sheffield township.

Section 6

Assessment of Environmental Effects

For a scheme-wide assessment of environmental effects refer to the overall scheme Assessment of June 2006. The assessment of the effects on the environment related to proposed works is detailed below.

Peak emergency flows will be small compared with natural floods, and will be rare, perhaps never occurring in the life of the scheme, and brief, lasting at the most for a few hours. It is considered that they will not cause erosion or deposition of material in the riverbed and their effects on the rivers will be less than minor.

6.1 Dust

Dust control measures will be provided for in the Dust Management Plan. The proposed works will be located a significant distance from residential units and will occur over a short time period. It is anticipated there will be no significant adverse effects arising from the Landuse activities associated with the discharge points.

6.2 Noise

Given the nature of the receiving environment and the scale of the effects, noise will not cause a significant adverse effect. Nevertheless the construction contract will required the contractor to produce a Construction Management Plan that will incorporate a Noise Management Plan. Each of these documents will demonstrate how the contractor proposes to mitigate any potential adverse effect from the machinery and construction methodologies that they propose.

6.3 Traffic

All Landuse activities are in a rural environment and will take place over a short time period.

The major mitigation measure proposed is a Traffic Management Plan as part of the Construction Management Plan that will detail the methods proposed by the contractor to minimise the impacts of construction traffic.

6.4 Hydrology

There will be no significant adverse effects on river or stream hydrology as a consequence of activities associated with the operational bywashes and emergency discharge points.

6.5 Effects of Sediment

Construction will result in the release of sediment in either runoff from the site or as a consequence of disturbance of the bed of the river/stream concerned. In general terms the rivers and streams of the upper central plains are adapted to a high sediment transporting environment and effects will be temporary and minor in nature.

Resource consent is required for the discharge of sediment to the rivers. Standard practices including sediment traps and retention ponds and sediment barriers in stream beds will be used to minimise the discharge and the effects. The Construction Management Plan will have a requirement to include a Stormwater Management Plan that will include the measures proposed by the contractor to control runoff and sediment discharges from the construction sites.

6.6 Effects on Water Quality

There are no expected impacts on water quality from the Landuse activities associated with the operational bywashes and emergency discharge points. The major contaminant that may be discharged

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Assessment of Environmental Effects

is sediment. As discussed above these river systems have a high capacity to transport sediment and any effects will be small and temporary.

The storage and use of hazardous substances such as diesel in these construction areas will pose a risk from spills. The storage of fuel oil will be in specially designated areas and tanks in excess of 10,000 L will be stored on areas that are bunded to control any spills should they occur. Runoff from the major construction areas will pass through sediment traps or settling basins before discharge back into the rivers. This will provide protection against discharges of hazardous substances.

The contractor will be required to prepare a Spill Contingency Plan as part of the Construction Management Plan that will specifically address the ways in which they will address the risks to water quality from construction activities.

6.7 Effects on Aquatic Biota

Aquatic biota can be affected by physical works and discharges. The physical works within stream beds will destroy the aquatic biota in the immediate vicinity and this cannot be mitigated. Due to the very localised nature of this effect, and the fact that affected habitats are already highly modified and have low sensitivities to disturbance, the impact on the environment will not be significant.

Discharges of sediments or other contaminants could also affect biota. The river environment is well adapted to sediment discharges and the risks from the discharge of hazardous substances can be mitigated as described above. Therefore the effects on aquatic biota from construction will be less than minor.

6.8 Effects on in-stream habitat

The construction of the bywash discharge structures has the potential to have localised short term effects on instream habitat. The highly dynamic nature of the instream habitat of the rivers and the localised scale of the effects (river bed disturbance and sediment inputs), short term nature of the effects and the proposed mitigation will generally ensure that any construction related effects on instream habitat is less than minor.

6.9 Effects on Significant Terrestrial and Aquatic Vegetation

There are no areas of significant terrestrial or aquatic vegetation that will be affected by the proposed works.

6.10 Effects on Birds and Terrestrial Fauna

There are no other significant bird species that will be affected by the construction activities. Most other bird species will be able to recolonise elsewhere. There are no significant other fauna that will be adversely affected.

6.11 Effects on Fish and recreation

There are no areas of significant effects on fish and recreational values as a result of the proposed works.

6.12 Effects on Social and Cultural Values

Many of the effects of construction on people have been discussed in the previous sections, such as dust, noise, and traffic etc. People may also be affected by the amenity impacts such as from the visual impact, potential loss of recreational activities and health and safety concerns. These effects are considered to be minor.

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Assessment of Environmental Effects

There is the potential for construction activities to impact on archaeological sites of importance/interest. It will be necessary to have a discovery protocol established prior to commencement of the physical works. It is proposed that an accidental discovery protocol be developed in consultation with tangata whenua and relevant bodies such as the Historic Places Trust.

Section 7

Mitigation

This section provides a description of the range of mitigations proposed throughout the scheme. These apply in general to the proposed bywashes although the scale of works associated with this application will make many of these mitigation measures unnecessary.

7.1 Section 17 RMA

Section 17 of the Resource Management Act (1991) places a duty of all people to avoid, remedy, or mitigate any adverse effect on the environment arising from an activity carried out by or on behalf of that person whether or not that activity is in accordance with a rule in a plan or resource consent.

7.2 Avoiding adverse effects on the environment

Where there are feasible options to avoid adverse environmental effects, this is the primary objective. This does not imply that any activity that may have an adverse effect should be avoided, as this would fail to meet the purpose of the Act, which is the sustainable management of natural and physical resources. Therefore the Act is about managing the effects and enabling people and communities to meet their foreseeable needs.

7.2.1 Management Plans

The construction activities will be controlled through the use of management plans. This is a tried and tested methodology to deal with activities and effects that cannot be defined fully at the time of resource consent application. Typically these plans identify all the sources of nuisance or hazard from a construction area and stipulate controls to avoid, mitigate or remedy these.

The management plans must be produced to comply with the conditions of consent, and will be lodged with Canterbury Regional Council and any other relevant parties (e.g., NZHPT, Transit New Zealand, etc) prior to commencing construction. They build on the requirements set out in any consent conditions and are applied to the specific designs for the project, the staging of its components and the methods of construction, all of which will only be known as the Scheme nears construction. These plans, once approved, then become rules for the contractor's management and operation of the activity.

Contractors involved in the scheme's construction will be required to prepare Construction Management Plans that include the following components:

Land Rehabilitation Plan

The proposed Land Rehabilitation Plan will address land restoration and rehabilitation requirements for the construction zone generally where land has been disturbed, race embankments, and construction storage areas. This plan will detail final contours and finished heights of earthworks; the methods for stripping, storing and re-using topsoil; vegetation removal and replanting requirements; and the rehabilitation of haul roads. In addition, provision will be made for the identification of specific ecological, heritage, cultural or geological features within or immediately adjoining the construction zone which are to be protected, the methods of such protection, and the identification of the features.

A Remediation Action Plan (for contaminated areas)

A Remediation Action Plan for contaminated areas will be prepared and lodged prior to any construction occurring and will be adhered to where construction of the race results in the disturbance of contaminated land (e.g., landfill, farm dump, offal pit, septic tank, silage pits, dairy effluent disposal ponds).

As a minimum the Remediation Action Plan will address

- The earthworks and transport controls to minimise the off-site mitigation of contamination (via air or water during the remedial works).

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Mitigation

- Appropriate measures for the control of dust or odour;
- The diversion of stormwater away from the remedial works;
- The treatment of contaminated stormwater or groundwater in the remediation area;
- Sampling and reporting;
- The health and safety requirements for remediation workers.

Hazardous Substances Management and Contingency Plan

These plans shall address storage and management requirements for hazardous substances, and contingencies and responses in the event that these substances are spilled.

Heritage Management Plan

Heritage Management Plans will be prepared to cover any destruction, damage or modification to any archaeological site, or historic site or building classified under the NZ Historic Places Trust Act 1993 and will identify any conditions to be complied with in relation to heritage.

Dust Management Plan

The Dust Management Plan will document:

- methods of dust suppression including use of sprinklers and water carts, and revegetation of stockpiles where appropriate;
- dust monitoring requirements;
- responsibilities for consultation with local residents about dust during construction;
- identification of areas which are sensitive to the effects of dust (eg, houses, specific crops, utilities, orchards) and identification of specific measures to mitigate the effects of dust on these sites;
- regular public road maintenance to ensure optimal surface conditions;
- proposed methods of providing a cleaning service to residents and businesses affected by dust from construction activities.

Noise Management Plan

The Noise Management Plan will be implemented in tandem with conditions of consent imposing specific noise controls. As such the Noise Management Plan will detail the noise sources associated with the construction of the distribution races and the noise control methods required to achieve compliance with conditions of consent imposing maximum noise levels. The Noise Management Plan will also document contingency plans (in the event that noise limits are exceeded), monitoring procedures, and complaints procedures. Finally, the Noise Management Plan will provide for the monitoring and management of any effects associated with vibration.

Traffic Management Plan

A Traffic Management Plan will be prepared and provided to both the Selwyn District Council and Transit New Zealand. This management plan will primarily address the management of construction traffic on

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Mitigation

public roads and locations where the distribution races and/or haul roads intersect with public roads. In particular, the Traffic Management Plan will require:

- The erection of signs on all public roads warning motorists of haul road intersections and associated hazards.
- Warning signage prohibiting public access to construction areas.
- Details of stock crossing methods as determined following consultation with local farmers.
- The notification of all temporary local road closures to local emergency services.
- All construction vehicles to be fitted with flashing lights while operating in the construction zone and on haul roads.
- Construction vehicles to comply with the Land Transport Safety Authority requirements for vehicle dimensions and mass on public roads, unless specific over dimension permits are obtained.
- Movement of oversize vehicles and equipment on SH 1, SH73 and SH 77 to comply with Transit New Zealand requirements.
- Road signs to be erected on roads where necessary to warn motorists of the hazard caused by fog or frost.
- Road safety audits to be carried out every six months of traffic signals/stop signs controlling the intersections of all public roads with haul roads and the review of these audits and implementation of any necessary steps to ensure motorists do not suffer unreasonable delays.
- The use of dust suppressant to mitigate the effects of dust.
- The maintenance of vehicles and machinery to mitigate the effects of fumes.

In addition to the general provisions of the Traffic Management Plan outlined above, particular measures shall be identified in a Traffic Management Plan dealing with State Highway intersections with haul roads. This plan shall be developed in accordance with the Transit New Zealand Code of Practice for Temporary Traffic Management.

Accidental Discovery Protocols

An accidental discovery protocol will be developed to cover instances where archaeological sites (prehistoric (Maori) and historic) are unearthed during the construction phase. This protocol will require an on-site assessment by a qualified archaeologist, notification of the New Zealand Historic Places Trust and Ngai Tahu, and further excavations, examinations and recording where necessary.

Health and Safety Plan

Whilst of limited relevance in terms of effects on the environment, the Health and Safety Plan will primarily stipulate codes of practice and relevant construction regulations that contractors will be required to follow. In addition, the Health and Safety Plan will also include information on hazard identification, management and mitigation, public consultation and information sharing requirements, emergency protocols and incident reporting.

In addition to the management plans referred to above, draft conditions of consent proposed by the applicant were included in Appendix D to the AEE of November 2005 and June 2006. These conditions outline the key requirements and performance measures for the various management plans above,

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including the methods for avoiding, remedying or mitigating adverse effects on the environment and requirements for monitoring and reporting.

Other management plans

Additional management plans may be prepared covering, for example:

- Risk Management Plan
- Stormwater Management Plan
- Spill Contingency Plan

7.2.2 Sustainable Farming

Many of the potential effects that have been identified as matters of concern during previous consultation have resulted in the development of strategies to avoid adverse effects. In particular the sustainable management of agricultural systems is paramount for the protection of ground and surface water resources, and this is being addressed particularly through the sustainability code of practice.

7.2.3 Ritso Society Irrigation Sustainability Code of Practice

The Ritso Society, formed in 2002, is named after Mr GF Ritso who in 1883, as engineer for Malvern County, had the vision for an irrigated Central Plains region. The Society has close links to the Central Plains Water Trust, and Central Plains Water Ltd, but is a separately incorporated body. They are currently undertaking a project supported by a Sustainable Farming Fund Grant and with funding from CPWL, the Ritso Society and others, that aims to bring together the wide range of information on irrigation already available and being developed in current projects; identify gaps in this information; and where practicable initiate further work to cover these issues. From this information an Irrigation Scheme Sustainability Code is being developed and tailored to the Central Plains Scheme.

While it is a major task to develop this code, it is also recognised that a vitally important aspect of the process is ensuring that primary producers, business people, and others participate in the development of the code, and embrace its implementation both at the individual on-farm level, and through the governance of the Water Enhancement Scheme by Central Plains Water Trust, and Central Plains Water Ltd.

In developing the code, key stakeholders from both the agriculture sector and wider community will be brought together to develop key aspects related to:

- Water efficiency measures;
- Water quality measures;
- Contractual requirements; and
- Use of economic instruments to achieve efficiency of use.

The key outputs of the project will be:

- A best practice irrigation scheme sustainability code that
 - Enables users to achieve best practice environmentally, and economically (i.e. maximise returns from minimum inputs);
 - Is practical and economically viable for water users;

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- Is dynamic and can be adapted over time to incorporate new technologies, and deal with new issues as they arise;
- The code will seek to ensure that adverse effects of the Scheme can be avoided or managed in both the design and operational phases of the Scheme;
- A workable framework for water and emissions trading;
- A process to allow intensification following irrigation to be achieved and monitored in a way that avoids or remedies adverse environmental effects; and
- Full reporting on processes, outputs, outcomes, and lessons learned. whereby

As a result, the individuals, organisations and networks involved in the code will become more knowledgeable about the key factors that will ensure development of irrigation that is socially and environmentally sustainable and economically viable.

7.3 Proposed Monitoring

Monitoring needs to be developed within a risk based framework. Where the potential risk of an adverse effect is high, then there should be more monitoring. Where the effects are well understood, easily mitigated, and remedied and minor, then no monitoring may be needed. Monitoring is designed to ascertain the effects of the consented activities and is not to be used to create data bases on the state of the environment – that being a Regional Council function. Monitoring also needs to be developed in conjunction with the resource consent conditions.

It is the intention of CPWL to commit to advance the detail of these applications in consultation with the various stakeholders to identify the monitoring required. For this reason no specific monitoring is proposed in this document, however the areas that CPWL anticipate will require monitoring are identified below.

7.3.1 Water distribution

The flows throughout the distribution system will be monitored. Each and every take from the system by the water users will be monitored for flow. Flow at the turnout structures will be determined based on gate settings and water surface levels. This information will be used to ensure the appropriate volume of water is discharged down the correct distribution canal.

7.3.2 Bywash volumes

At the ends of the distribution system there will be bywash discharges to wetlands, surface waters and groundwater. These will be measured through control structures.

7.3.3 Wetland functioning

Wetlands developed for the purpose of bywash filtering or environmental enhancement will require periodic inspections to ensure sufficient water is provided to maintain a healthy ecosystem.

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Statutory Framework

8.1 Introduction

This section assesses the statutory framework applicable to the proposed works, with particular respect to the Resource Management Act 1991 and the underpinning Regional and District Plans.

The following statutory documents are reviewed and assessed in this section:

- Resource Management Act 1991
- Canterbury Regional Policy Statement
- Transitional Regional Plan
- Natural Resources Regional Plan

8.2 Resource Management Act 1991

8.2.1 Part 2 – Purpose and Principles

Section 5

Section 5 of the RMA contains the purpose of the Act:

5. Purpose

- (1) *The purpose of this Act is to promote the sustainable management of natural and physical resources.*
- (2) *In this Act, “sustainable management” means managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural wellbeing and for their health and safety while –*
 - (a) *Sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and*
 - (b) *Safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and*
 - (c) *Avoiding, remedying, or mitigating any adverse effects of activities on the environment.*

Section 6

Section 6 of the RMA contains matters of national importance, to be recognised and provided for in achieving the purpose of the Act:

6. Matters of national importance

In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall recognise and provide for the following matters of national importance:

- (a) *The preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development:*
- (b) *The protection of outstanding natural features and landscapes from inappropriate subdivision, use, and development:*
- (c) *The protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna:*
- (d) *The maintenance and enhancement of public access to and along the coastal marine area, lakes, and rivers:*
- (e) *The relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga.*

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- (f) *The protection of historic heritage from inappropriate subdivision, use, and development.*
- (g) *The protection of recognised customary activities.*

Section 7

Section 7 of the RMA contains other matters which shall be given particular regard to in achieving the purpose of the Act:

7. Other matters

In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall have particular regard to –

- (a) *kaitiakitanga:*
 - (aa) *the ethic of stewardship:*
 - (b) *the efficient use and development of natural and physical resources:*
 - (ba) *the efficiency of the end use of energy:*
 - (c) *the maintenance and enhancement of amenity values:*
 - (d) *intrinsic values of ecosystems:*
 - (e) *repealed.*
 - (f) *maintenance and enhancement of the quality of the environment:*
 - (g) *any finite characteristics of natural and physical resources:*
 - (h) *the protection of the habitat of trout and salmon:*
 - (i) *the effects of climate change:*
- (j) *the benefits to be derived from the use and development of renewable energy*

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Section 8 of the RMA states the role of the Treaty of Waitangi in achieving the purpose of the Act:

8. Treaty of Waitangi

In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall take into account the principles of the Treaty of Waitangi (Te Tiriti o Waitangi).

In the original application it was noted that the CPW scheme has the potential to deliver social and economic benefits to the community, while sustaining the water and land resources, maintaining their life-supporting capacity, and avoiding, remedying or mitigating adverse effects on the environment. Through careful design, construction and operation methods, significant environmental values within the project area can be maintained and in many instances enhanced.

The above statement is also true for the proposed bywashes and associated works. The proposed works are not contrary to any of the matters of national importance listed in s6 of the RMA, any of the other matters listed in s7 of the Act, nor the Principles of the Treaty of Waitangi referred to in s8 of the RMA.

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8.2.2 Part III – Duties and Restrictions

RMA Section	Summary	Consent Authority
9(3)	No person may use land [e.g. earthworks, build structures] in a manner that contravenes a rule in a regional or proposed regional plan, unless allowed by a resource consent.	Canterbury Regional Council
13	<p>No person may, in relation to the bed of a river or lake:</p> <ul style="list-style-type: none"> • Use, erect and maintain/repair structures; or • Excavate or disturb the bed; or • Introduce plants; or • Deposit substances; or • Reclaim or drain the bed, unless expressly allowed by a rule in a regional, proposed regional plan or by a resource consent. <p>No person may:</p> <ul style="list-style-type: none"> • Enter or pass across the bed of a river or lake; or • Disturb, damage or remove plants, in a manner that contravenes a rule in a regional plan or proposed regional plan, unless allowed by a resource consent. 	Canterbury Regional Council

8.3 Canterbury Regional Policy Statement

The Canterbury Regional Policy Statement (RPS) became operative in June 1998. The RPS provides an overview of the resource management issues of the region and its chapters contain objectives, policies and methods relating to specific resources of the natural and physical environment. The chapters of particular relevance to the works are:

- Chapter 5 - Matters of Resource Management Significance to Tangata Whenua
- Chapter 6 - Provision for the Relationship of Tangata Whenua with Resources
- Chapter 8 - Landscape, Ecology and Heritage
- Chapter 9 - Water
- Chapter 14 - Energy
- Chapter 16 - Natural Hazards

The provisions contained in Sections 5-8 of the RMA provide the framework for the objectives and policies of the RPS. The RPS in turn provides the framework for the issues, objectives, policies and methods of the underlying Regional Plans. These are discussed in greater detail in the following sections.

8.4 Transitional Regional Plan (TRP)

The following rules are relevant to the proposed works:

Clauses 28: No person shall widen, deepen, alter or divert the course if a watercourse

Clause 29: No person shall remove shingle, sand or other material from the water course.

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Clause 30: No person shall plant willows or other trees

Clause 31: No person shall erect any structures or fence within 24 feet of a water course

The proposed works will not comply with the above clauses therefore, the proposed activity is classified as a discretionary activity under the TRP

8.5 Natural Resources Regional Plan

8.5.1 Objectives and Policies

Chapter 4 – Water Quality

The provisions of the Water quality chapter apply to the proposed activity.

Policy WQL5: Management of riparian margins

- (1) *Maintain or improve water quality, the quality of river bed substrate, or aquatic habitats in a river or lake by:*
 - (a) *ensuring activities that disturb or deposit soil or vegetation on the margin of a river or lake are undertaken in ways that:*
 - (i) *minimise the discharge of sediment into water; or*
 - (ii) *do not increase the rate of erosion of the bed or banks of the water body.*
 - (b) *retaining, maintaining, or planting riparian vegetation that effectively:*
 - (i) *minimises the supply of sediment from bank erosion;*
 - (ii) *reduces the concentration of nutrients, sediment and animal faecal matter in overland flow from adjacent land; and*
 - (iii) *shades water and controls the excessive growth of macrophytes or algae, or limits large fluctuations in the daily water temperature.*
- (2) *When giving effect to Policy WQL(1)(b), the retention, maintenance or planting of riparian vegetation should, as far as practicable:*
 - (a) *contribute to the indigenous biodiversity of the area, particularly plant communities that are threatened or under-represented;*
 - (b) *provide for a diversity of habitats for indigenous fauna;*
 - (c) *improve or establish connections between riparian plant communities which create corridors for wildlife dispersal;*
 - (d) *not reduce the flood carrying capacity of a river, or cause adverse effects on the stability or performance of essential structures;*
 - (e) *avoid the establishment of pest plant and animal species, and implement measures to control the spread of pest species;*
 - (f) *not impede existing public access to or along a river or lake;*
 - (g) *not impede existing access for the maintenance of drains; and*
 - (h) *take into account the effects of a change from short to tall vegetation on the flow regime in a catchment identified in Chapter 5, Appendix WQN4. Where there is a conflict between the effects of vegetation on the flow regime and the need to retain or plant vegetation for water quality purposes, an assessment should be made of the relative costs and benefits of using tall vegetation for these purposes.*

A number of aspects of the proposed activity will impact on the riparian margins. Such impacts will be kept to the minimum practicable to allow these bywashes to be established. Best practice works

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methodologies and structural design will be employed to avoid and mitigate adverse effects on water quality from sediment discharge, and to reduce the potential for bank erosion. Where appropriate vegetation will be replanted to enhance amenity and riparian habitat, and provide erosion protection. Overall, it is expected the project will not be contrary to Policy WQL5.

Chapter 6 – Bed and margins of lakes and rivers

The provisions of the Chapter 6 apply to all river beds in the project area – including the Selwyn and Hawkins.

Objective BLR1 Activities within the beds and margins

Activities in the beds and margins are able to be undertaken while:

- (a) protecting flood carrying capacity to avoid increased risk of flooding of surrounding lands;
- (b) protecting the stability of lawfully established structures and the banks of lakes and rivers;
- (c) minimising the spreading or colonising by pest or undesirable plants;
- (d) preserving natural character;
- (e) protecting outstanding natural features and landscapes;
- (f) protecting areas of significant indigenous vegetation and significant habitat of indigenous fauna;
- (g) promoting the maintenance and enhancement of amenity values;
- (h) providing for the relationship of Ngāi Tahu and their culture and traditions with their ancestral lands, water, sites, wāhi tapu, and other taonga;
 - (i) avoiding, remedying or mitigating adverse effects of reductions in sediment transport to the coast where there is a crucial link to rates of coastal erosion; and
 - (j) protecting significant habitat of trout and salmon.

Policy BLR1 Effects of activities within the bed or margins

(1) Control land use activities, including:

- (a) the use, erection, reconstruction, placement, alteration, extension, demolition or removal of structures;
- (b) excavating, drilling, tunnelling or other disturbance;
- (c) the introduction, planting, pruning, removal or harvesting of plants;
- (d) the depositing of any substance, including residential, commercial and industrial waste; and
- (e) reclamation or drainage,

within:

- (i) the beds of lakes and rivers;
- (ii) 7.5 metres of the bed of a lake or river; or
- (iii) 7.5 metres of any flood control structure,

to ensure that the achievement of objective BLR1 is not compromised. In particular, activities shall not:

1. restrict the passage and/or the dynamics of water flow in a manner that generates or leads to a reduction in flood carrying capacity;
2. cause localised scouring or erosion that adversely impacts on the bed or banks of lakes and rivers, or the stability of lawfully established structures; or

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- 3. *create an increase in undesirable or pest plant infestation, unless it can be demonstrated through the resource consent process that adequate mitigation measures can be undertaken.*
- (2) *Encourage land holders and users of the beds and margins of lakes and rivers to undertake their activities such that the achievement of Objective BLR1 is not compromised.*

Construction of the bywashes may require a range of disturbance works and structures in the beds and margins of rivers. All works and structures involve disturbing/excavating the river bed during construction, and to a much lesser extent during future maintenance activities. Vegetation, both in the bed and on the banks of the rivers, may also require removal to facilitate construction and maintenance activities. It is also possible that vegetation may be planted, to provide amenity enhancement and erosion protection.

All works and structures will be constructed and maintained in such a way that adverse effects on floodway carrying capacity, river dynamics, erosion, amenity values, natural character, public access, and cultural values, will either be avoided or minimised to the greatest extent practicable. It is expected the CPW project will not be contrary to Objective BRL1 and Policy BRL1.

8.5.2 Rules

Resource consents are required from Environment Canterbury under the Natural Resources Regional Plan as summarised in Table 8-1 below.

Figure 8-1: Summary of Activity Status under the Proposed Natural Resources Regional Plan

Consent Type	Activity	Relevant Rules	Activity Status
Section 9(3) Landuse (Riparian)	To excavate and disturb land, deposit material, and remove and plant vegetation in the riparian margins.	WQL32 - WQL34 BLR 7 & BLR 8	Restricted discretionary under WQL34; discretionary under Rule BRL8
Section 13 Landuse (bed) (Restrictions on certain uses of bed of lakes and rivers)	To erect, and maintain discharge structures and erosion protection works and to carry out associated excavations.	BLR 1-BLR 5, & BLR 8	Discretionary