

Appendix C

Canterbury Regional Council Resource Consent
Conditions

Schedule 1: General Conditions

Schedule 2; Administrative Conditions

Schedules of Locations

Selwyn District Council Resource Consent Conditions

Selwyn District Council Designation Conditions

Schedule 3: Bonding

Extracts from New Zealand Dam Safety Guildelines
2000

Regional Council Consents

CRC061769

To excavate land to depths exceeding five metres, or deeper than the highest groundwater level at the site, and to deposit material into excavated land for the purposes of constructing the dam and reservoir. A consent with a duration of 35 years is sought.

Proposed conditions:

1. This consent shall be subject to the conditions listed in Schedule 1: General Conditions, and Schedule 2: Administrative Conditions.
2. Works shall be confined to the areas shown on the accompanying plan Central Plains Water Enhancement Scheme – Designation Map 11.

CRC061814

To excavate land to a depth exceeding five metres, or deeper than the highest groundwater level at the site, and to deposit material into excavated land for the purposes of constructing an Inlet Canal, Headrace Canal and Water Distribution Race Network, along and adjacent to the routes identified in Schedules A.2 - A.4. A consent with a duration of 35 years is sought.

Proposed conditions:

1. This consent shall be subject to the conditions listed in Schedule 1: General Conditions, and Schedule 2: Administrative Conditions.
3. Works shall be confined to the areas shown on the accompanying plans Central Plains Water Enhancement Scheme – Designation Maps 2 – 10, Long Tunnel Designation Map 1, Distribution Network Maps 2 - 25.
4. The material deposited shall comprise only:
 - (a) inert materials, being rock, stones, gravel, sand, silt, clay or soil, provided these are uncontaminated with any hazardous substance; or
 - (b) concrete or cured asphalt.
5. The volume of vegetative material in any ten cubic metres of material deposited shall not exceed five percent.

CRC061817

To excavate and disturb land, deposit material, and remove and plant vegetation, in the riparian margins of the Waianiwaniwa River associated with construction of the dam and reservoir. A consent with a duration of 35 years is sought.

Proposed conditions:

1. This consent shall be subject to the conditions listed in Schedule 1: General Conditions, and Schedule 2: Administrative Conditions.

CRC061820

To excavate and disturb land, deposit material, and remove and plant vegetation associated with any construction, operational or maintenance activity relating to the Headrace, Inlet Canal, and Water Distribution Race Network, in the riparian margins of the surface waterbodies listed in Schedules

B.1 - B.4. A consent with a duration of 35 years is sought.

Proposed conditions:

1. This consent shall be subject to the conditions listed in Schedule 1: General Conditions, and Schedule 2: Administrative Conditions.

CRC061822

To excavate and disturb land, deposit material and remove and plant vegetation, in the riparian margin of the Rakaia River, associated with the construction and maintenance of the Rakaia water intake system. A consent with a duration of 35 years is sought.

Proposed conditions:

1. This consent shall be subject to the conditions listed in Schedule 1: General Conditions, and Schedule 2: Administrative Conditions

CRC061842

To excavate and disturb land, deposit material and remove and plant vegetation, in the riparian margin of the Waimakariri River, associated with any construction, operational or maintenance activities in the area of the upper Waimakariri water intake system. A consent with a duration of 35 years is sought.

Proposed conditions:

1. This consent shall be subject to the conditions listed in Schedule 1: General Conditions, and Schedule 2: Administrative Conditions.

CRC061843

To excavate and disturb land, deposit material and remove and plant vegetation, in the riparian margin of the Waimakariri River, associated with any construction, operational or maintenance activities in the area of the lower Waimakariri water intake system. A consent with a duration of 35 years is sought.

Proposed conditions:

1. This consent shall be subject to the conditions listed in Schedule 1: General Conditions, and Schedule 2: Administrative Conditions.

CRC061953

To excavate and disturb land, deposit material, and remove and plant vegetation, in the riparian margins of the Waianiwiwa River and reservoir, associated with the use and maintenance of the dam, reservoir, and related infrastructure. A consent with a duration of 35 years is sought.

Proposed conditions:

1. This consent shall be subject to the conditions listed in Schedule 1: General Conditions, and Schedule 2: Administrative Conditions.

CRC061954

To excavate and disturb land, deposit material, and remove and plant vegetation, associated with any operational or maintenance activity relating to the Inlet Canal, Headrace Canal, and Water Distribution Race Network in the riparian margins of the surface waterbodies identified in Schedules B.1 to B.4. A consent with a duration of 35 years is sought.

Proposed conditions:

1. This consent shall be subject to the conditions listed in Schedule 1: General Conditions, and Schedule 2: Administrative Conditions.

CRC072761

A land use consent to excavate a tunnel over unconfined or semi-confined aquifers along the route between the Waimakariri portal and Waianiwaniwa portal. A duration of 35 years is sought.

Proposed conditions:

1. This consent is subject to the conditions listed in Schedule 1: General Conditions.
2. Works shall be confined to the area shown on the accompanying plan Central Plains Water Enhancement Scheme – Long Tunnel Designation Map 1.
3. No hazardous materials shall enter groundwater.

CRC072765

A land use consent to store hazardous substances (principally diesel) to power machinery and plant at the Waimakariri portal and Waianiwaniwa portal. A duration of 10 years is sought.

Proposed conditions:

1. This consent is subject to the conditions listed in Schedule 1: General Conditions.
2. The volume of any storage tank shall not exceed 20,000 litres.
3. Any containment system surrounding a storage tank shall be constructed to have an available retention capacity of at least 120% of the volume of stored material.
4. The containment systems shall be constructed of impermeable material.
5. Design plans of the storage tank and containment system shall be provided to the Canterbury Regional Council prior to works commencing.

CRC073034

A land use consent 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 riparian margins to create a 0.1-0.2 hectare constructed wetland, at or about map reference NZMS 260 L35: 289-421, near Hawkins Road, adjacent to the Selwyn River.

Proposed conditions:

1. This consent shall be subject to the conditions listed in Schedule 1: General Conditions, and Schedule 2: Administrative Conditions.
2. All practicable steps shall be undertaken to ensure that the works do not deflect floodwaters into the berm.
3. The consent holder shall provide a bond in favour of the Canterbury Regional Council to secure performance of this consent as outlined in Schedule 3 attached.

CRC073035

A land use consent 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 Hawkins River, and to excavate and disturb land, deposit material, and remove vegetation, associated with any operational or maintenance activity relating to the bywashes in the riparian margins of the Hawkins River, at or about Map reference NZMS 260 L35: 281-574.

Proposed conditions:

1. This consent shall be subject to the conditions listed in Schedule 1: General Conditions, and Schedule 2: Administrative Conditions.
2. All practicable steps shall be undertaken to ensure that the works do not deflect floodwaters into the berm.
3. The consent holder shall provide a bond in favour of the Canterbury Regional Council to secure performance of this consent as outlined in Schedule 3 attached.

CRC061845

To erect, use and maintain the dam, in, on, under and over the bed of the Waianiwaniwa River and to construct and maintain a tunnel portal in, on, under and over the bed of the Waianiwaniwa River. A consent with a duration of 35 years is sought.

Proposed conditions:

1. The dam shall be located at or about map reference NZMS 260 L35: 274-478, and shall not rise above a Reduced Level of 283 metres with respect to the Lyttelton Datum (1937).
2. The design, construction and operation of the dam shall be in general accordance with the technical documents provided to the Canterbury Regional Council in support of this application.
3. The consent holder shall inform the Canterbury Regional Council one month in advance of the intended commencement of construction activities.
4. The works referred to in Condition 2 shall be supervised by persons with appropriate experience in the supervision of civil engineering construction works.

5. The quality of the construction materials shall be proved as part of the dam design process or the design of any subsequent works. Records of all steps taken in proving, shall form part of the dam design documentation or the design documentation for any subsequent works.
6. The consent holder shall provide a certificate, signed by a Chartered Engineer, to the Canterbury Regional Council stating that the dam or any subsequent works on the dam has been designed in accordance with accepted civil engineering practice.
7. On completion of dam construction or any subsequent works the consent holder shall supply a construction certificate, signed by a Chartered Engineer experienced in dam construction retained by the consent holder, to the Canterbury Regional Council stating that the dam and associated works have been constructed in accordance with the design referred to in Conditions (5) and (6) above.
8. The consent holder shall ensure that erosion control measures are in place prior to the exercise of this consent and that all practicable steps are taken to prevent contamination of natural run-off by suspended solids during the construction period.
9. The consent holder shall forward a copy of the Certificate of Practical Completion together with a copy of the final 'as built' plans for any works undertaken to the Canterbury Regional Council.
10. The consent holder shall be responsible for the structural integrity and maintenance of all works associated with the exercise of this consent and for any erosion control works that become necessary as a consequence of the exercise of this consent.
11. If, following a flood, any auxiliary spillway requires reinstatement such reinstatement shall be carried out under Conditions (1) through (11) of this consent. There shall be no excavation of material to be used for reinstatement from channels containing flowing water.
12. A dam safety surveillance and monitoring plan shall be prepared and submitted to Canterbury Regional Council one month prior to the commencement of the filling of the Waianiwaniwa Reservoir. This plan shall follow the guidelines set out in Appendix E of the New Zealand Dam Safety Guidelines, produced by the New Zealand Society on Large Dams, dated November 2000, as appended to these conditions, and in addition shall incorporate the following elements:
 - (a) continuous telemetred measurement of the turbidity and rate of the combined discharge from the internal drainage system;
 - (b) a weekly visual inspection of the dam;
 - (c) weekly monitoring of the rate of discharge from each individual drain and the piezometric pressure within the dam;
 - (d) a weekly review of the internal drainage flow data, with immediate review capability by a suitably qualified and competent dam engineer if alert levels are exceeded;
13. A dam safety surveillance and monitoring report prepared at least every two months by the dam engineer that includes the following:
 - (a) confirmation that the monitoring and review programme has been followed;
 - (b) analysis and interpretation of the monitoring data, in particular the adverse trends, warnings or observation of relevance to dam safety; and

- (c) confirmation that the dam performance is within acceptable limits as set out in Condition (15) and the report in Condition 14(a) above shall be prepared, certified by the dam engineer and submitted to Canterbury Regional Council within the first five working days of the month following preparation of the report.
14. The surveillance and monitoring plan referred to in Condition (14) must identify alert levels for key performance indicators and precautionary actions to be taken if alert levels are reached or exceeded. The key performance indicators must include:
- (a) the rate of discharge of total internal drainage flow exceeding historic maxima for the corresponding lake level;
 - (b) any apparent indication of internal erosion of the dam;
 - (c) the turbidity or rate of discharge from the internal drainage increasing by more than 10 percent over historic maxima for a continuous period of seven days; and
 - (d) the level of the lake exceeding the specified maximum operating level at any time.
15. A dam safety surveillance report covering the previous year to 31 March and prepared by a suitably qualified and chartered professional engineer shall be prepared and submitted to Canterbury Regional Council by the last working day in April each year. The report shall be accompanied by a certificate from the consent holder that in its opinion and following due inquiries it is satisfied that the report is properly issued. The report shall include the following:
- (a) results of a physical inspection of the dam pursuant to Condition 7(b) undertaken within the previous three months;
 - (b) review of monitoring data obtained in exercising Condition 14 for the year, and a comparison with data from previous years;
 - (c) details of any mitigating actions taken or incidents of significance to dam safety in the year;
 - (d) review of the performance of the dam with respect to safety, and confirmation that the dam is operating within acceptable limits and any recommendations of relevance to dam safety.
16. An Emergency Action Plan shall be prepared in accordance with Appendix F of the New Zealand Dam Safety Guidelines produced by the New Zealand Society on Large Dams, dated November 2000, appended to these consents, and shall include an inundation map for potential dam break scenarios. The Plan shall be maintained in a current state at all times such that it is accurate as to personnel and procedures.
- (a) The Plan, and any subsequent changes to the Plan, shall be prepared in consultation with Canterbury Regional Council, and Selwyn District Council.
 - (b) The Plan shall be submitted to Canterbury Regional Council one month prior to the commencement of the filling of the Waianiwaniwa Reservoir.
17. A review of the safety of the dam shall be undertaken by a Safety Review Team in accordance with Appendix G and all other relevant sections of the New Zealand Dam Safety Guidelines, produced by the New Zealand Society on Large Dams, dated November 2000 as appended to these conditions, at least every five years and as soon as practicable following an unusual event such as a major flood or major earthquake. A "major flood" is a flood causing the loss of the dam's spillway, and a

“major earthquake” is an earthquake producing an estimated intensity at the dam of IX or greater on the Modified Mercalli scale.

18. A report of the safety review shall be prepared and provided to the Canterbury Regional Council within five working days of the report becoming available to the consent holder.
19. Within one year of the issuance of the report, the consent holder shall provide the Canterbury Regional Council with a report:
 - (a) stating how the recommendations in the report of the safety review have been addressed;
 - (b) including a certificate by a chartered engineer that all recommendations contained in the safety review have been addressed; and
20. This consent is subject to the conditions listed in Schedule 2: Administrative Conditions
21. The consent holder shall provide a bond in favour of the Canterbury Regional Council to secure performance of this consent as outlined in Schedule 3 attached.

CRC061846

To place, operate, maintain and repair Inlet Canal, Headrace Canal, and Water Distribution Race Network Structures, including siphons, pipes, and erosion protection structures, and associated bed excavation and disturbance, in, on, under, or over the beds of the surface waterbodies listed in Schedules B.1 - B.4. A consent with a duration of 35 years is sought.

Proposed Conditions:

1. This consent is subject to the conditions listed in Schedule 1: General Conditions, and Schedule 2: Administrative Conditions.
2. All practicable steps shall be undertaken to ensure that the works do not deflect floodwaters into the berm.
3. The consent holder shall provide a bond in favour of the Canterbury Regional Council to secure performance of this consent as outlined in Schedule 3 attached.

CRC061847

To erect, and maintain discharge structures and erosion protection structures and carry out associated bed excavation and disturbance, in, on, under, and over the bed of the surface waterbodies listed in Schedules C.1 - C.4. The structures and works will be associated with the construction and maintenance of the inlet Canal, Headrace Canal, and Water Distribution Race Network. A consent with a duration of 35 years is sought.

Proposed conditions:

1. This consent is subject to the conditions listed in Schedule 1: General Conditions, and Schedule 2: Administrative Conditions.
2. All practicable steps shall be undertaken to ensure that the works do not deflect floodwaters into the berm.

3. The consent holder shall provide a bond in favour of the Canterbury Regional Council to secure performance of this consent as outlined in Schedule 3 attached.

CRC061863

To place structures in the bed of the Rakaia River and to excavate, disturb and deposit bed material, remove and plant vegetation to facilitate the construction, operation and maintenance of the Rakaia water intake system. A consent with a duration of 35 years is sought.

Proposed conditions:

1. This consent is subject to the conditions listed in Schedule 1: General Conditions, and Schedule 2: Administrative Conditions.
2. Works to disturb the bed of the Rakaia River shall only be undertaken at or about map reference NZMS 260 K36: 071-391.
3. Works shall be confined to the area shown on the accompanying plan Central Plains Water Enhancement Scheme – Designation Map 10.
4. Works shall be limited to:
 - (a) Those which are necessary to construct and maintain the intake system required to facilitate the taking of water authorised by resource consent CRC061940.
 - (b) Removal of debris, removal or trimming trees within the footprint of the intake system.
5. The consent holder shall provide a bond in favour of the Canterbury Regional Council to secure performance of this consent as outlined in Schedule 3 attached.

CRC061866

To place structures in the bed of the Waimakariri River and to excavate, disturb and deposit bed material, remove and plant vegetation to facilitate the construction, operation and maintenance of the upper Waimakariri water intake system. A consent with a duration of 35 years is sought.

Proposed conditions:

1. This consent is subject to the conditions listed in Schedule 1: General Conditions, and Schedule 2: Administrative Conditions.
2. Works to disturb the bed of the Waimakariri River shall only be undertaken at or about map reference NZMS 260 L35: 252-678.
3. Works shall be confined to the area shown on the accompanying plan Central Plains Water Enhancement Scheme – Designation Map 1.
4. Works shall be limited to:
 - (a) That which are necessary to construct and maintain the intake system required to facilitate the flow of water to the irrigation intake authorised by resource consent CRC061941.
 - (b) Removal of debris, removal or trimming trees within the footprint of the intake system.

5. Any gravel excavated during the disturbance of the bed of the Waimakariri River as part of the works authorised by this consent must be deposited on, or near to, the excavation site in piles not exceeding 1.5 metres in height.
6. Any banks formed must be no higher than 2.5 metres above the adjacent river level at the time of construction.
7. The consent holder shall provide a bond in favour of the Canterbury Regional Council to secure performance of this consent as outlined in Schedule 3 attached.

CRC061868

To place structures in the bed of the Waimakariri River and to excavate, disturb and deposit bed material, remove and plant vegetation to facilitate the construction, operation and maintenance of the lower Waimakariri water intake system. A consent with a duration of 35 years is sought.

Proposed conditions:

1. This consent is subject to the conditions listed in Schedule 1: General Conditions, and Schedule 2: Administrative Conditions.
2. Works to disturb the bed of the Waimakariri River shall only be undertaken at or about map reference NZMS 260 L35: 252-678.
3. Works shall be confined to the area shown on the accompanying plan Central Plains Water Enhancement Scheme – Designation Map 3.
4. Works shall be limited to:
 - (a) That which are necessary to construct and maintain the intake system required to facilitate the flow of water to the irrigation intake authorised by resource consent CRC061941.
 - (b) Removal of debris, removal or trimming trees within the footprint of the intake system.
5. The consent holder shall provide a bond in favour of the Canterbury Regional Council to secure performance of this consent as outlined in Schedule 3 attached.

CRC061939

To dam water in the Waianiwaniwa River for the purpose of creating the reservoir. A consent with a duration of 35 years is sought.

Proposed conditions:

1. The lake shall have a maximum operational level of 280 metres and a minimum operating level of 246 metres, both levels expressed in terms of the Lyttelton Datum (1937).
2. The consent holder shall prepare a Mudfish Protection Management Plan to address the issue of loss of habitat for mudfish as a consequence of constructing the Central Plains Water Enhancement Scheme. The consent holder shall submit the plan to the Canterbury Regional Council, attention RMA compliance and Enforcement Manager, at least one month prior to the commencement of any construction works. The plan shall address the following specific issues:

- (a) Creation of new protected mudfish habitat in the Waianiwaniwa Valley on land designated for the scheme.
 - (b) Retention of the genetic stock from the Waianiwaniwa Valley.
 - (c) Provision of a captive management facility for Waianiwaniwa Valley mudfish for the purposes of:
 - (i) holding mudfish while wetlands are created,
 - (ii) breeding additional Canterbury mudfish for translocations, and
 - (iii) retaining Canterbury mudfish stocks in severe drought seasons.
 - (d) Survey previously unsurveyed spring and wetland habitats of the Hororata River catchment to provide up to date distribution and abundance data for the Central Plains area.
 - (e) Monitoring of key mudfish populations and other mudfish populations in the Central Plains area.
 - (f) Fencing and management of riparian habitats around mudfish sites in the Hororata River catchment.
 - (g) Enhancement and enlargement of wetland habitat in the Hororata River catchment.
 - (h) Promotion of legal protection of mudfish habitat by use of covenants to ensure the protection of wetland, stream and riparian habitat at mudfish sites.
 - (i) Management of predatory fish stock in the Hororata and Waianiwaniwa Rivers and associated springs, wetlands and drains within the scheme area where Canterbury mudfish are present.
 - (j) Pest fish incursion monitoring in the Central Plains region.
 - (k) Provision of opportunities to undertake revegetation of riparian zones in the Hororata River area utilising indigenous vegetation and by doing so contribute to the creation of an indigenous vegetation corridor across this region of the Canterbury Plains.
3. Two years prior to filling the reservoir, the consent holder shall cease the use of fertiliser and pesticide in the inundation area.
 4. Prior to filling the reservoir, the consent holder shall remove all trees in the reservoir footprint.
 5. The consent holder shall install and maintain a continuous flow recorder site on the inlet canal from the upper Waimakariri River intake and thus continuously record the flow in the canal. Full access to the flow records obtained from this site shall be provided to the Canterbury Regional Council upon request.
 6. The consent holder shall devise and carry out a monitoring programme which measures and reports on the following:
 - (a) Daily lake levels;
 - (b) Weed growth and control within the lake and on the lake margins;
 - (c) The incidence of dust nuisance associated with the lake margins.

7. The consent holder shall monitor at two monthly intervals (during a period of settled weather) the quality of water in Waianiwaniwa Reservoir adjacent to the dam; and the water discharged to the headrace canal for the following determinands:
 - (a) Dissolved Oxygen
 - (b) Temperature
 - (c) Turbidity
 - (d) Electrical Conductivity
 - (e) Total Nitrogen
 - (f) Total Phosphorus
 - (g) Total Organic Carbon
 - (h) Chlorophyll A

All methods of sampling, laboratory procedures, and analysis shall be under the supervision of or undertaken by an independently accredited laboratory.

8. The consent holder shall lodge a copy of the proposed monitoring programme required under Condition (4) with the Canterbury Regional Council before filling of the lake commences.
9. The consent holder shall forward to the Canterbury Regional Council by March 31 each year a report containing the results obtained under the sampling, monitoring and reporting programme of Condition (4) of this consent.
10. This consent is subject to the conditions listed in Schedule 2: Administrative Conditions.

CRC061767

To dam water and to divert water within the Waianiwaniwa River during construction of the dam and reservoir. A consent with a duration of 35 years is sought.

Proposed conditions:

1. This consent is subject to the conditions listed in Schedule 1: General Conditions, and Schedule 2: Administrative Conditions.
2. The diversion shall not obstruct or alter the passage of water outside of the designated footprint of the dam and reservoir in a manner that causes:
 - (a) Any increase in the risk or potential for flooding of surrounding lands;
 - (b) Any destabilising of lawfully established structures within the beds of rivers;
 - (c) Any increase in erosion of river beds or banks

CRC061768

To dam and divert water during construction of the Headrace and Water Distribution Race Network, including constructing siphons, pipes, and erosion protection structures

or works, in the surface waterbodies identified in Schedules B.2 - B.4. A consent with a duration of 35 years is sought.

Proposed conditions:

1. This consent is subject to the conditions listed in Schedule 1: General Conditions, and Schedule 2: Administrative Conditions.
2. The diversion shall not obstruct or alter the passage of water in a manner that causes:
 - (a) Any increase in the risk or potential for flooding of surrounding lands;
 - (b) Any destabilising of lawfully established flood control structures or flood control structures or any other lawfully established structures within the beds of rivers;
 - (c) Any increase in erosion of river beds or banks

CRC061940

To divert water within the Rakaia River towards the Rakaia water intake system to enable the taking of water from the Rakaia River for irrigation and ancillary purposes, and for sediment sluicing and fish pass purposes within the Rakaia water intake system and through the headrace canal and distribution network as described in schedules A3 and A4, which includes water being diverted within the headrace canal and distribution network both above and below ground level. A consent with a duration of 35 years is sought.

Proposed conditions:

1. The diversion shall not prevent the passage of fish, or cause the stranding of fish in pools or channels
2. The diversion shall not obstruct or alter the passage of water in a manner that causes:
 - (a) Any increase in the risk or potential for flooding of surrounding lands;
 - (b) Any destabilising of lawfully established structures within the beds of rivers;
 - (c) Any increase in erosion of river beds or banks;
3. This consent is subject to the conditions listed in Schedule 2: Administrative Conditions.

CRC061941

To divert water within the Waimakariri River towards the upper Waimakariri water intake system to enable the taking of water for irrigation and ancillary purposes, and for sediment sluicing and fish passes within the upper Waimakariri water intake system and through the headrace canal and distribution network as described in schedules A2 to A4, which includes water being diverted within the headrace canal and distribution network both above and below ground level. A consent with a duration of 35 years is sought.

Proposed conditions:

1. The diversion shall not prevent the passage of fish, or cause the stranding of fish in pools or channels

2. The diversion shall not obstruct or alter the passage of water in a manner that causes:
 - (a) Any increase in the risk or potential for flooding of surrounding lands;
 - (b) Any destabilising of lawfully established structures within the beds of rivers;
 - (c) Any increase in erosion of river beds or banks.
3. This consent is subject to the conditions listed in Schedule 2: Administrative Conditions.

CRC061943

To divert water in the Waimakariri River towards the lower Waimakariri water intake system to enable the taking of water for irrigation and ancillary purposes, and for sediment sluicing and fish passes within the lower Waimakariri water intake system and through the headrace canal and distribution network as described in schedules A3 and A4, which includes water being diverted within the headrace canal and distribution network both above and below ground level. A consent with a duration of 35 years is sought.

Proposed conditions:

1. The diversion shall not prevent the passage of fish, or cause the stranding of fish in pools or channels
2. The diversion shall not obstruct or alter the passage of water in a manner that causes:
 - (a) Any increase in the risk or potential for flooding of surrounding lands;
 - (b) Any destabilising of lawfully established structures within the beds of rivers;
 - (c) Any increase in erosion of river beds or banks.
3. This consent is subject to the conditions listed in Schedule 2: Administrative Conditions.

CRC061925

To take water for dewatering purposes during construction of the Inlet Canal, Headrace Canal, and Water Distribution Race Network, including for the purposes of constructing siphons, pipes, and erosion protection structures/works, in the surface waterbodies identified in Schedules B.1 - B.4. A consent with a duration of 35 years is sought.

Proposed conditions:

1. This consent is subject to the general conditions listed in Schedule 1: General Conditions, and Schedule 2: Administrative Conditions.
2. Water shall only be taken in association with the dewatering required to facilitate construction of the Inlet Canal, Headrace Canal, and Water Distribution Race Network (including for the purposes of constructing siphons, pipes, and erosion protection structures/works)
3. Dewatering water shall not cause adverse effects on surrounding property or infrastructure.

4. The consent holder shall submit to the Canterbury Regional Council RMA Compliance and Enforcement Manager at least one month prior to the exercise of this consent, a Dewatering Management Plan outlining the construction and management practices and procedures to be adopted in order that compliance with the conditions of this consent can be achieved and the effects of the dewatering activities are minimised to the greatest extent practicable. The plan shall include, but not necessarily be limited to:
 - (a) The extent of the construction activities in relation to the areas where dewatering will be required.
 - (b) The types of dewatering methods to be adopted and details of where water will be directed and disposed of.
 - (c) A construction management programme including timetable, sequence of events and duration.
 - (d) The mitigation measures to be adopted to minimise the effects of dewatering on surrounding property and infrastructure.
 - (e) Contact details for the person in charge of the site works.
5. The consent holder may at any time, submit to the Canterbury Regional Council, an amended Dewatering Management Plan for the purposes of improving the efficiency and or quality of the dewatering or to remove or reduce an adverse environmental effect.

CRC061927

To take surface water and groundwater for dewatering purposes during construction of the dam and reservoir. A consent with a duration of 35 years is sought.

Proposed conditions:

1. This consent is subject to the general conditions listed in Schedule 1: General Conditions, and Schedule 2: Administrative Conditions.
2. Water shall only be taken in association with the dewatering required to facilitate construction of the dam and storage lake as shown on plan Central Plains Water Enhancement Scheme – Designation Map 11.
3. Dewatering water shall not cause adverse effects on surrounding property or infrastructure.
4. The consent holder shall submit to the Canterbury Regional Council RMA Compliance and Enforcement Manager at least one month prior to the exercise of this consent, a Dewatering Management Plan outlining the construction and management practices and procedures to be adopted in order that compliance with the conditions of this consent can be achieved and the effects of the dewatering activities are minimised to the greatest extent practicable. The plan shall include, but not necessarily be limited to:
 - (a) The extent of the construction activities in relation to the areas where dewatering will be required.
 - (b) The types of dewatering methods to be adopted and details of where water will be directed and disposed of.

- (c) A construction management programme including timetable, sequence of events and duration.
 - (d) The mitigation measures to be adopted to minimise the effects of dewatering on surrounding property and infrastructure.
 - (e) Contact details for the person in charge of the site works.
5. The consent holder may at any time, submit to the Canterbury Regional Council, an amended Dewatering Management Plan for the purposes of improving the efficiency and or quality of the dewatering or to remove or reduce an adverse environmental effect.

CRC061930

To take water from the Waianiwaniwa River, for use during the construction of the dam, reservoir and tunnel portal, including for concrete batching plant purposes, the control of moisture in compacted soil, and for the control of dust. A consent with a duration of 35 years is sought.

Proposed conditions:

1. This consent is subject to the general conditions listed in Schedule 1: General Conditions, and Schedule 2: Administrative Conditions.
2. Water shall only be taken and used to facilitate construction of the dam, ancillary structures and storage lake as shown on plan Central Plains Water Enhancement Scheme – Designation Map 11.

CRC061972

To take and use water from the Waimakariri River at a maximum rate of 40 cubic metres per second via the upper Waimakariri water intake system and/or the lower Waimakariri water intake system, for the purposes of irrigation of up to 60,000 hectares of land within the Scheme Area, for water storage, and for ancillary purposes associated with the operation of the Central Plains Water Enhancement Scheme. A consent with a duration of 35 years is sought..

Proposed conditions:

1. The maximum total combined take from the Waimakariri River, at the upper and lower intake sites shall not exceed 40 cubic metres per second.
2. Subject to Condition 1, whenever the flow in the Waimakariri River, as estimated by the Canterbury Regional Council from measurements at the Old Highway Bridge, at or about map reference NZMS 260 M35: 818-547, is greater than 41 cubic metres per second, the actual rate of take shall not result in the flow in the river falling to below 41 cubic metres per second.
3. Condition 2 does not confer priority rights to the consent holder for Class A and Class B water as defined by the Waimakariri River Regional Plan, that has been previously allocated by resource consent. Condition 2 does allow the consent holder to abstract any Class A or Class B water that may be allocated to other consent holders, but is not being taken at that time, provided written approval has been obtained from the existing consent holder that allows the consent holder to take its unused allocated water.

4. If the flow in the Waimakariri River, as estimated by the Canterbury Regional Council from measurements at the Old Highway Bridge, at or about map reference NZMS 260 M35: 818-547, is less than or equal to 41 cubic metres per second for a continuous period of 14 days, the consent holder will not take water until the flow rate is greater than 41 cubic metres per second for a period of 2 days or until the flow is greater than 100 cubic metres per second, whichever is the sooner.
5. All necessary measures shall be undertaken to prevent fish entering the intake, including the installation of a fish screen in accordance with condition 10 below.
6. Fish screens shall be installed and maintained on the diversion channels and the mesh aperture size of the screen shall not exceed five millimetres.
7. Each fish screen shall be inspected at maximum intervals of two days for any damage causing fish to pass through the screen, or once every 24 hour period when the flow in the Rakaia River is greater than 300 cubic metres per second, as estimated by Canterbury Regional Council, from measurements at either the gorge recorder site (at or about map reference NZMS 260 K35:015-424) or the recorder site at Fighting Hill (at or about map reference NZMS 260 K35:997-437).
8. In the event that a screen is damaged such that the screen mesh aperture is greater than those specified in Condition 6, the screen shall be repaired or replaced as soon as practicable or the damaged screen shutdown. Any screen shut down shall not be opened again until a screen that complied with Condition 5 is fitted.
9. The incidence of screen shutdowns shall be recorded and reported to the North Canterbury Fish and Game Council as soon as practicable. Records of screen failure shall be forwarded to Canterbury Regional Council at the end of each irrigation season, or as requested.
10.
 - (a) Prior to the taking of water pursuant to this consent, the consent holder shall install, operate and maintain a fish screen ("the screen") or deflection barrier across the intake designed in accordance with the certified plans approved by a person duly authorised by the Canterbury Regional Council in accordance with Condition 10(f).
 - (b) The screen or deflection barrier shall, as far as practicable, prevent the entrainment, impingement and entrapment of salmonids including adults, fingerlings and fry and for the purposes of this condition this shall be achieved by installing, operating and maintaining a fish screen or deflection barrier in accordance with the certified design plans referred to in Condition 10(c).
 - (c) The design plans for the screen or deflection barrier shall be certified by: a suitably qualified engineer with experience in the design and operation of fish screens and deflection barriers; and a fisheries biologist specialising in salmonid fisheries ("the Certifiers").
 - (d) Prior to the commencement of construction of the fish screen or deflection barrier, the consent holder shall provide to the Canterbury Regional Council:
 - (i) The certified design plans including the screen or deflection barrier slot/aperture size, sweep velocity, approach velocity and, if relevant, an effective by-pass which returns fish to an actively flowing braid of the river;

- (ii) A report from the Certifiers which certifies the design and operation of the screen or deflection barrier:
 - Demonstrates best practice in achievement of Condition 10(b);
 - Takes into consideration regional or national guidelines in relation to fish screen and/or deflection barrier design and/or any international guidelines that the Certifiers consider relevant.
 - (e) A person duly authorised by the Canterbury Regional Council shall give written notice to the consent holder stating whether or not it approves of the certified design plans within 20 working days of receipt of the plans and the certifiers report referred to in Condition 10(d) and such approval shall not be unreasonably withheld.
 - (f) The consent holder shall, prior to commissioning, provide a certificate from a suitably qualified person confirming that construction of the screen or deflection barrier has occurred in accordance with the certified design plans approved in accordance with Condition 10(e).
 - (g) After installation the consent holder shall commission an audit by an independent research organisation approved by the Canterbury Regional Council to determine the effectiveness of the screen or deflection barrier installed. The methodology to be adopted shall be approved by the Canterbury Regional Council. The consent holder shall provide the results of the audit to the Canterbury Regional Council within 18 months of the commissioning of the Central Plains Water Enhancement Scheme take.
11. The rate at which water is taken shall be measured to within an accuracy of 10%, and the measurement and the hours during which water is taken shall be recorded. A copy of the records shall be provided to Canterbury Regional Council upon request.
 12. A steel grill shall be placed over the inlet to the intake structure and, as far as is practicable, shall be positioned such that it minimises the risk to water users.
 13. Signs warning of the position of the intake structure shall be erected at points upstream of the intake that are used by the public to enter the Waimakariri River.
 14. A warning sign visible from 50 metres upstream shall be erected adjacent to the intake.
 15. All commercial users and recreational boat clubs shall, as far as is practicable, be informed in writing of the position of the intake, within one month of the start of construction of the intake.
 16.
 - (a) Within six months of the commencement of this consent, the consent holder shall install a water flow measuring device that has an International accreditation, New Zealand or equivalent calibration endorsement, to continuously measure the taking of water in terms of this permit to within an accuracy of 10 percent.
 - (b) The measuring device shall, as far as is practicable, be installed at a site likely to retain a stable rating. The measuring device shall be installed in accordance with established standards (National Institute of Water and Atmospheric research (NIWA) manual / standard) by competent / qualified person.

- (c) A site inspection of the site of the measuring device shall be carried out at least once every month to determine the need for re-gauging the site.
 - (d) The measuring site shall be gauged at least every three months and at any time, when determined by a site inspection.
 - (e) Gaugings and site inspections shall be carried out in accordance with the following manuals: Hydrologists Field Manual (NIWA 1991), Telemetry Manual (NIWA 1994), and Procedure for Rating a Flow Station (NIWA 1993) or any replacement publication.
 - (f) The rates and times of abstraction shall be recorded by electronic means, at not greater than fifteen minute intervals, in a tamper-proof recording device such as a data-logger, kept for that purpose. The recorded data shall be retained for not less than 12 months.
 - (g) All measuring and recording devices shall be available for inspection at all times by the Canterbury Regional Council.
 - (h) All data from the recording device described in sub-condition (a) shall be provided to the Canterbury Regional Council on request, and shall be accessible and available for downloading at all times by the Canterbury Regional Council.
 - (i) Within six months of the commencement of this consent, and at five-yearly intervals thereafter, and at any other reasonable time when requested by Canterbury Regional Council, the consent holder shall provide a certificate to the Canterbury Regional Council signed by a suitably qualified person certifying the accuracy of the measuring and recording devices installed in accordance with clauses (a) and (b), and also certifying that data can be readily accessed.
17. The consent holder shall ensure that appropriate water supply agreements are entered into with all users of water from the Central Plains Water Enhancement Scheme to as far as is practicable:
- (a) Ensure that the volume of water applied does not exceed that required for the soil to reach field capacity; and
 - (b) Ensure that there is no surface run-off from irrigation; and
 - (c) Avoid leakage from pipes and structures forming part of the reticulation system associated with the abstraction; and
 - (d) Avoid the application of abstracted water onto non-productive land such as impermeable surfaces and river or stream riparian strips.
18. If as a direct consequence of the exercise of this consent, the water supply to any residential dwelling does not meet the Drinking-Water Standards for New Zealand 2000, the consent holder shall provide at its own cost a potable water supply which meets these standards for domestic use.
19. This consent is subject to the conditions listed in Schedule 2: Administrative Conditions.

CRC061973

To use water from the Rakaia River at a maximum rate of 40 cubic metres per second via the Rakaia water intake system, for the purposes of irrigating up to 60,000 hectares

of land within the Scheme Area, for water storage, and for ancillary purposes associated with the operation of the Central Plains Water Enhancement Scheme.

Proposed conditions:

1. The consent holder shall ensure that appropriate water supply agreements are entered into with all users of water from the Central Plains Water Enhancement Scheme to as far as is practicable;
2. Ensure that the volume of water applied does not exceed that required for the soil to reach field capacity; and
3. Ensure that there is no surface run-off from irrigation; and
4. Avoid leakage from pipes and structures forming part of the reticulation system associated with the abstraction; and
5. Avoid the application of abstracted water onto non-productive land such as impermeable surfaces and river or stream riparian strips.
6. If as a direct consequence of the exercise of this consent, the water supply to any residential dwelling does not meet the Drinking-Water Standards for New Zealand 2000, the consent holder shall provide at its own cost a potable water supply which meets these standards for domestic use.

CRC021091

To take water from the Rakaia River at a maximum combined rate of 40 cubic metres per second via either the Rakaia water intake system, or the Ashburton Community water intake system, for the purposes of irrigation of land within the Central Plains Scheme Area and/or Mid-Canterbury, for water storage, and for ancillary purposes associated with the operation of the Central Plains Water Enhancement Scheme and the Ashburton Community Water Trust Scheme. The combined take may include water allocated to another water user that is not being taken, or any water in a higher priority band that has not been allocated, provided that the water allocation rules in the National Water Conservation (Rakaia River) Order are complied with. A consent with a duration of 35 years is sought.

Proposed conditions:

1. The rate at which water is taken from the Rakaia River, at or about map reference NZMS 260 K36:050-393, and at or about map reference NZMS 260 K36:072-391 shall not exceed a combined take of 40 cubic metres per second.
2. Except as provided for in condition 4, whenever the mean flow for the 24 hour period ending at noon on any one day (expressed in cubic metres per second) in the Rakaia River, as estimated by Canterbury Regional Council from measurements at either the gorge recorder site (at or about map reference NZMS 260 K35:015-424) or the recorder site at Fighting Hill (at or about map reference NZMS 260 K35:997-437), falls below the following flows ($Y \text{ m}^3/\text{s}$), the taking of water in terms of this permit shall cease:

Note: In the event that water in higher priority bands becomes available for allocation to other water users, then the minimum flows in this condition will require amendment to recognise the priority rights of the consent holder.

3. Except as provided for in condition 4, whenever the mean flow for the 24 hour period ending at noon on any one day (expressed as X cubic metres per second) in the Rakaia River, as estimated by Canterbury Regional Council from measurements at either the gorge recorder site (at or about map reference NZMS 260 K35:015-424) or the recorder site at Fighting Hill (at or about map reference NZMS 260 K35:997-437), exceeds the minimum flow Y as contained in condition 2, then the take shall not exceed Z m³/s where:

$$Z = (X-Y)/2 \quad \text{and} \quad Z < 40 \text{ m}^3/\text{s}$$

PROVIDED THAT whenever Canterbury Regional Council, in consultation with the Water Users Group representing all water users who are subject to the same minimum flow restriction, has determined upon a water sharing regime which restricts abstraction from the Rakaia River to half the flow above the minimum flows specified in Condition 2, then the taking of water in accordance with that determination shall be deemed to be in compliance with this condition.

4. In the event that any water allocated to another water user is not being taken, or there is water that has not been allocated within a higher priority band, the consent holder may take that water provided that the water allocation rules in the NWCO are complied with and provided written approval has been obtained from the existing consent holder that allows the consent holder to take its unused allocated water..
5. Fish screens shall be installed and maintained on the diversion channels and the mesh aperture size of the screen shall not exceed five millimetres.
6. Each fish screen shall be inspected at maximum intervals of two days for any damage causing fish to pass through the screen, or once every 24 hour period when the flow in the Rakaia River is greater than 300 cubic metres per second, as estimated by Canterbury Regional Council, from measurements at either the gorge recorder site (at or about map reference NZMS 260 K35:015-424) or the recorder site at Fighting Hill (at or about map reference NZMS 260 K35:997-437).
7. In the event that a screen is damaged such that the screen mesh aperture is greater than those specified in Condition 6, the screen shall be repaired or replaced as soon as practicable, or the damaged screen shutdown. Any screen shut down shall not be opened again until a screen that complied with Condition 5 is fitted.
8. The incidence of screen shutdowns shall be recorded and reported to the North Canterbury Fish and Game council as soon as practicable. Records of screen failure shall be forwarded to Canterbury Regional Council at the end of each irrigation season, or as requested.
9.
 - (a) Prior to the taking of water pursuant to this consent, the consent holder shall install, operate and maintain a fish screen ("the screen") or deflection barrier across the intake designed in accordance with the certified plans approved by a person duly authorised by the Canterbury Regional Council in accordance with Condition 9 (f).
 - (b) The screen or deflection barrier shall, as far as practicable, prevent the entrainment, impingement and entrapment of salmonids including adults, fingerlings and fry and for the purposes of this condition this shall be achieved by

- installing, operating and maintaining a fish screen or deflection barrier in accordance with the certified design plans referred to in Condition 9(c).
- (c) The design plans for the screen or deflection barrier shall be certified by: a suitably qualified engineer with experience in the design and operation of fish screens and deflection barriers; and a fisheries biologist specialising in salmonid fisheries (“the Certifiers”).
- (d) Prior to the commencement of construction of the fish screen or deflection barrier, the consent holder shall provide to the Canterbury Regional Council:
- (i) The certified design plans including the screen or deflection barrier slot/aperture size, sweep velocity, approach velocity and, if relevant, an effective by-pass which returns fish to an actively flowing braid of the river;
 - (ii) A report from the Certifiers which certifies the design and operation of the screen or deflection barrier:
 - Demonstrates best practice in achievement of Condition 9(b);
 - Takes into consideration regional or national guidelines in relation to fish screen and/or deflection barrier design and/or any international guidelines that the Certifiers consider relevant.
- (e) A person duly authorised by the Canterbury Regional Council shall give written notice to the consent holder stating whether or not it approves of the certified design plans within 20 working days of receipt of the plans and the certifiers report referred to in Condition 9(d) and such approval shall not be unreasonably withheld.
- (f) The consent holder shall, prior to commissioning, provide a certificate from a suitably qualified person confirming that construction of the screen or deflection barrier has occurred in accordance with the certified design plans approved in accordance with Condition 9(e).
- (g) After installation the consent holder shall commission an audit by an independent research organisation approved by the Canterbury Regional Council to determine the effectiveness of the screen or deflection barrier installed. The methodology to be adopted shall be approved by the Canterbury Regional Council. The consent holder shall provide the results of the audit to the Canterbury Regional Council within 18 months of the commissioning of the Central Plains Water Enhancement Scheme take.
10. The rate at which water is taken shall be measured to within an accuracy of 10%, and the measurement and the hours during which water is taken shall be recorded. A copy of the records shall be provided to Canterbury Regional Council upon request.
11. A steel grill shall be placed over the inlet to the intake structure and, as far as is practicable, shall be positioned such that it minimises the risk to water users.
12. Signs warning of the position of the intake structure shall be erected at points upstream of the intake that are used by the public to enter the Rakaia River.
13. A warning sign visible from 50 metres upstream shall be erected adjacent to the intake.

14. All commercial users and recreational boat clubs shall, as far as is practicable, be informed in writing of the position of the intake, within one month of the start of construction of the intake.
15. This consent is subject to the conditions listed in Schedule 2: Administrative Conditions.

CRC072762

A water permit to take water for dewatering the tunnel during construction along the route between the Waimakariri portal and Waianiwiwa portal. A duration of 10 years is sought.

Proposed conditions:

1. This consent is subject to the conditions listed in Schedule 1: General Conditions.
2. Water shall only be taken for the purposes of dewatering required to facilitate construction of the tunnel
3. Dewatering water shall not cause adverse effects on surrounding property or infrastructure.
4. The consent holder shall submit to the Canterbury Regional Council RMA Compliance and Enforcement Manager at least one month prior to the exercise of this consent, a Dewatering Management Plan outlining the construction and management practices and procedures to be adopted in order that compliance with the conditions of this consent can be achieved and the effects of the dewatering activities are minimised to the greatest extent practicable. The plan shall include, but not necessarily be limited to:
 - (a) The extent of the construction activities in relation to the areas where dewatering will be required.
 - (b) The types of dewatering methods to be adopted and details of where water will be directed and disposed of.
 - (c) A construction management programme including timetable, sequence of events and duration.
 - (d) The mitigation measures to be adopted to minimise the effects of dewatering on surrounding property and infrastructure.
 - (e) Contact details for the person in charge of the site works.
5. The consent holder may at any time, submit to the Canterbury Regional Council, an amended Dewatering Management Plan for the purposes of improving the efficiency and or quality of the dewatering or to remove or reduce an adverse environmental effect.

CRC061870

To discharge contaminants, being principally sediment, and water to the Waianiwiwa River, during construction of the dam and reservoir. A consent with a duration of 35 years is sought.

Proposed conditions:

1. This consent is subject to the general conditions listed in Schedule 1: General Conditions, and Schedule 2: Administrative Conditions.
2. The discharges shall only be water and contaminants (principally suspended solids) reasonably necessary to facilitate the construction of the dam, reservoir and related facilities and shall only occur within the area as shown on the accompanying plan Central Plains Water Enhancement Scheme – Designation Map 11.
3. The discharge of water shall be undertaken in accordance with the management plan prepared in accordance with Condition 1 of this consent, to minimise sediment suspension and transport arising from the taking, diverting or use of water.

CRC061871

To discharge contaminants, being principally sediment, and water associated with any construction activity relating to the construction and maintenance of the Inlet Canal, Headrace Canal and Water Distribution Race Network, to water in surface water bodies listed in Schedules B.1 - B.4. A consent with a duration of 35 years is sought.

Proposed conditions:

1. This consent is subject to the general conditions listed in Schedule 1: General Conditions, and Schedule 2: Administrative Conditions.
2. The discharges shall only be water and contaminants (principally suspended solids) reasonably necessary for the construction, operation and maintenance of the inlet canal, headrace canal, and water distribution race network and shall only occur within the areas shown on the accompanying plans Central Plains Water Enhancement Scheme – Designation Maps 2 – 10, Long Tunnel Designation Map 1, Distribution Network Maps 2 - 25.
3. The discharge of water shall be undertaken in accordance with the management plan prepared in accordance with condition 1 of this consent, to minimise sediment suspension and transport arising from the taking, diverting or use of water.

CRC061873

To discharge water and contaminants, being principally sediment, to the Rakaia River from the construction, operation and maintenance of the Rakaia water intake system. A consent with a duration of 35 years is sought.

Proposed conditions:

1. This consent is subject to the general conditions listed in Schedule 1: General Conditions, and Schedule 2: Administrative Conditions.
2. The discharges shall only be water and contaminants (principally suspended solids) reasonably necessary for the construction, operation and maintenance of the intake structures, sediment sluicing, fish pass and diversion channels and shall only occur within the areas shown on the accompanying plan Central Plains Water Enhancement Scheme – Designation Map 10.
3. The discharge of water shall be undertaken in accordance with the management plan prepared in accordance with Condition 1 of this consent, to minimise sediment suspension and transport arising from the taking, diverting or use of water.

CRC061875

To discharge water and contaminants, being principally sediment, to the Waimakariri River from construction, operation and maintenance activities on the upper Waimakariri water intake system. A consent with a duration of 35 years is sought.

Proposed conditions:

1. This consent is subject to the general conditions listed in Schedule 1: General Conditions, and Schedule 2: Administrative Conditions.
2. The discharges shall only be water and contaminants (principally suspended solids) reasonably necessary for the construction, operation and maintenance of the intake structures, sediment sluicing, fish pass and diversion channels intake structures, sediment sluicing, fish pass and diversion channels and shall only occur within the areas shown on the accompanying plan Central Plains Water Enhancement Scheme – Designation Map 1.
3. The discharge of water shall be undertaken in accordance with the management plan prepared in accordance with condition 1 of this consent, to minimise sediment suspension and transport arising from the taking, diverting or use of water.

CRC061920

To discharge water and contaminants, being principally sediment, to the Waimakariri River from construction, operation and maintenance activities on the lower Waimakariri water intake system. A consent with a duration of 35 years is sought.

Proposed conditions:

1. This consent is subject to the general conditions listed in Schedule 1: General Conditions, and Schedule 2: Administrative Conditions.
2. The discharges shall only be water and contaminants (principally suspended solids) reasonably necessary for the construction, operation and maintenance of the intake structures, sediment sluicing, fish pass and diversion channels intake structures, sediment sluicing, fish pass and diversion channels and shall only occur within the areas shown on the accompanying plan Central Plains Water Enhancement Scheme – Designation Map 3.
3. The discharge of water shall be undertaken in accordance with the management plan prepared in accordance with condition 1 of this consent, to minimise sediment suspension and transport arising from the taking, diverting or use of water

CRC061922

To discharge stormwater, which may contain contaminants, onto or into land, in circumstances where it may enter water, from all construction areas associated the Central Plains Water Enhancement Scheme. A consent with a duration of 35 years is sought.

Proposed conditions:

1. This consent is subject to the general conditions listed in Schedule 1: General Conditions, and Schedule 2: Administrative Conditions.
2. The discharge of water shall be undertaken in accordance with the stormwater and wastewater management plan prepared in accordance with condition 1 of this consent, to minimise sediment suspension and transport arising from the discharge of stormwater runoff.
3. The discharge shall be only stormwater from hardstanding and unpaved surfaces at construction areas associated with the Central Plains Water Enhancement Scheme.
4. Any substance, which is a hazardous substance in terms of the Hazardous Substance and New Organisms Act (HASNO) (1996) shall be stored in a bunded or contained area.
5. In the event of a spillage of fuel or any other contaminant stored, used or handled at a site, emergency response procedures shall be undertaken to prevent contaminants leaving the site. These procedures shall include but not be limited to:
 - (a) Informing the Canterbury Regional Council of any significant contaminant spill event at the time the event occurs; and
 - (b) Maintaining a record of any spill where contaminants enter the stormwater system. The record shall be made available to staff at the Canterbury Regional Council on request. The record shall include the following information:
 - (c) The date, time and duration of the incident.
 - (d) The type, including proprietary names where appropriate, of contaminant(s) spilled.
 - (e) An estimate of the volume of contaminant(s) spilled; and
 - (f) Details of the steps taken to control and remediate the effects of any such spill event on the receiving environment.
6. A stormwater and wastewater management plan for the stormwater treatment and disposal system shall be submitted to the Canterbury Regional Council prior to the use of the system. This plan shall set out how the system will be operated and maintained to ensure compliance with conditions of this consent. The plan shall include but not necessarily be limited to:
 - (a) Design plans of stormwater collection and discharge systems.
 - (b) Details of the activities that will occur on site.
 - (c) Any hazardous chemicals (including fuel and oils) that will be held on site and their storage requirements.

CRC061924

To discharge stormwater, which may contain contaminants, from all construction areas into the Waimakariri River and the Rakaia River and the water bodies listed in Schedules B.1-,B.4. A consent with a duration of 35 years is sought.

Proposed conditions:

1. This consent is subject to the general conditions listed in Schedule 1: General Conditions, and Schedule 2: Administrative Conditions.

2. The discharge of water shall be undertaken in accordance with the stormwater and wastewater management plan prepared in accordance with condition 1 of this consent, to minimise sediment suspension and transport arising from the discharge of stormwater runoff.
3. The discharge shall be only stormwater from hardstanding and unpaved surfaces at construction areas associated with the Central Plains Water Enhancement Scheme.
4. Any substance, which is a hazardous substance in terms of the Hazardous Substance and New Organisms Act (HASNO) (1996) shall be stored in a bunded or contained area.
5. In the event of a spillage of fuel or any other contaminant stored, used or handled at a site, emergency response procedures shall be undertaken to prevent contaminants leaving the site. These procedures shall include but not be limited to:
 - (a) Informing the Canterbury Regional Council of any significant contaminant spill event at the time the event occurs; and
 - (b) Maintaining a record of any spill where contaminants enter the stormwater system. The record shall be made available to staff at the Canterbury Regional Council on request. The record shall include the following information:
 - (c) The date, time and duration of the incident.
 - (d) The type, including proprietary names where appropriate, of contaminant(s) spilled.
 - (e) An estimate of the volume of contaminant(s) spilled; and
 - (f) Details of the steps taken to control and remediate the effects of any such spill event on the receiving environment.
6. A stormwater and wastewater management plan for the stormwater treatment and disposal system shall be submitted to the Canterbury Regional Council prior to the use of the system. This plan shall set out how the system will be operated and maintained to ensure compliance with conditions of this consent. The plan shall include but not necessarily be limited to:
 - (a) Design plans of stormwater collection and discharge systems.
 - (b) Details of the activities that will occur on site.
 - (c) Any hazardous chemicals (including fuel and oils) that will be held on site and their storage requirements.

CRC061928

To discharge water taken for dewatering purposes during construction or maintenance works to land in circumstances where it may enter water, and to water in the surface waterbodies identified in Schedules B.1 - B.4. A consent with a duration of 35 years is sought.

Proposed conditions:

1. This consent is subject to the general conditions listed in Schedule 1: General Conditions, and Schedule 2: Administrative Conditions.
2. Water shall only be taken in association with the dewatering required to facilitate the construction of the Central Plains Water Enhancement Scheme facilities described in the application documents.
3. Dewatering water shall not cause adverse effects on surrounding property or infrastructure.
4. The consent holder shall submit to the Canterbury Regional Council RMA Compliance and Enforcement Manager at least one month prior to the exercise of this consent, a Dewatering Management Plan outlining the construction and management practices and procedures to be adopted in order that compliance with the conditions of this consent can be achieved and the effects of the dewatering activities are minimised to the greatest extent practicable. The plan shall include, but not necessarily be limited to:
 - (a) The extent of the construction activities in relation to the areas where dewatering will be required.
 - (b) The types of dewatering methods to be adopted and details of where water will be directed and disposed of.
 - (c) A construction management programme including timetable, sequence of events and duration.
 - (d) The mitigation measures to be adopted to minimise the effects of dewatering on surrounding property and infrastructure.
 - (e) Contact details for the person in charge of the site works.
5. The consent holder may at any time, submit to the Canterbury Regional Council, an amended Dewatering Management Plan for the purposes of improving the efficiency and or quality of the dewatering or to remove or reduce an adverse environmental effect.

CRC061945

To discharge stormwater, which may contain contaminants, onto or into land, in circumstances where it may enter water, from all structures including but not limited to: Inlet Canal, Headrace Canal, Water Distribution Race Network, dam and reservoir, roads, hardstand areas and utility buildings associated with the Central Plains Water Enhancement Scheme. A consent with a duration of 35 years is sought.

Proposed conditions:

1. This consent is subject to the general conditions listed in Schedule 2: Administrative Conditions.
2. The discharge shall be only stormwater from hardstanding and unpaved surfaces at facilities associated with the Central Plains Water Enhancement Scheme.
3. A Spill Contingency Plan shall be submitted to the Canterbury Regional Council prior to the use of the system.

4. In the event of a spillage of fuel or any other contaminant stored, used or handled at a site, emergency response procedures shall be undertaken to prevent contaminants leaving the site. These procedures shall include but not be limited to:
 - (a) Informing the Canterbury Regional Council of any significant contaminant spill event at the time the event occurs; and
 - (b) Maintaining a record of any spill where contaminants enter the stormwater system. The record shall be made available to staff at the Canterbury Regional Council on request. The record shall include the following information:
 - (c) The date, time and duration of the incident.
 - (d) The type, including proprietary names where appropriate, of contaminant(s) spilled.
 - (e) An estimate of the volume of contaminant(s) spilled; and
 - (f) Details of the steps taken to control and remediate the effects of any such spill event on the receiving environment.
5. A stormwater management plan for the stormwater treatment and disposal system shall be submitted to the Canterbury Regional Council prior to the use of the system. This plan shall set out how the system will be operated and maintained to ensure compliance with conditions of this consent. The plan shall include but not necessarily be limited to:
 - (a) Design plans of stormwater collection and discharge systems.
 - (b) Details of the activities that will occur on site.
 - (c) Any hazardous chemicals (including fuel and oils) that will be held on site and their storage requirements.

CRC061949

To discharge water and contaminants to land in circumstances where it may enter water, in the form of seepage from beneath the Reservoir, and along the length of the Inlet Canal, Headrace Canal, Water Distribution Race Network, and wetlands, as listed in Schedules A1-A4 and C3-C4. A consent with a duration of 35 years is sought.

Proposed conditions:

1. The storage and conveyance structures shall be designed and constructed to as far as practicable minimise the loss of water to ground.
2. This consent is subject to the conditions listed in Schedule 2: Administrative Conditions.

CRC061950, CRC071916 and CRC071917

To discharge surplus water and contaminants, from the Headrace and Water Distribution Race Network to land in circumstances where it may enter groundwater, and to water at the locations listed in Schedules C.1 - C.4. A consent with a duration of 35 years is sought.

Proposed conditions:

1. The rate of flow at any discharge point shall not exceed that shown in the following table.

Location	Site map reference	Maximum operational flow (m ³ /s)	Emergency peak flow (m ³ /s)
Waimakariri	NZMS260 L35:477-496	n/a	9.0
Waimakariri	NZMS260 M35:523-490	0.4	1.0
Waimakariri	NZMS260 M35:539-488	0.4	3.0
Hawkins	NZMS260 L36:394-330	0.4	3.0
Hawkins	NZMS260 L35:281-574	0.3	2.5
Waianiwaniwa	NZMS260 L36:351-358	0.2	2.0
Selwyn	NZMS260 L36:456-301	0.8	7.0
Selwyn	NZMS260 L36:441-305	0.8	8.5
Selwyn	NZMS260 L36:350-345	0.4	2.5
Selwyn	NZMS260 L36:435-299	0.4	3.5
Selwyn	NZMS260 L35:289-421	0.4	3.0
Hororata	NZMS260 L36:337-334	n/a	1.0
Rakaia	NZMS260 L36:329-184	1.5	16.5
Rakaia	NZMS260 L36:264-219	n/a	5.5

2. The discharge shall not result in significant erosion of the bed or banks of any watercourse.
3. This consent is subject to the conditions listed in Schedule 2: Administrative Conditions

CRC061974

To discharge water and contaminants from the headrace canal to the Waianiwaniwa River at or about map reference NZMS 260 L35: 275-476. A consent with a duration of 35 years is sought.

Proposed conditions:

1. The rate of flow shall not exceed the mean annual flow of the Waianiwaniwa River.
2. The discharge shall not result in significant erosion of the bed or banks of the Waianiwaniwa River.
3. This consent is subject to the conditions listed in Schedule 2: Administrative Conditions

CRC061975

To discharge water and contaminants from the reservoir to water in the headrace canal at or about map reference NZMS 260 L35: 275-476. A consent with a duration of 35 years is sought

Proposed conditions:

1. The rate of flow shall not exceed 45 cubic metres per second.
2. As far as practicable and when necessary to maintain water quality in the irrigation or bywash water, the release of water from the reservoir shall be from the upper layers of the reservoir.
3. This consent is subject to the conditions listed in Schedule 2: Administrative Conditions

CRC061976

To discharge water and contaminants from the tunnel portal to land and water in the reservoir at or about map reference NZMS 260 L35: 283-540. A consent with a duration of 35 years is sought.

Proposed conditions:

1. The rate of flow shall not exceed 40 cubic metres per second.
2. The discharge shall not result in significant erosion of the bed or banks of the Waianiwaniwa River or the bed or banks of the Waianiwaniwa Reservoir.
3. This consent is subject to the conditions listed in Schedule 2: Administrative Conditions

CRC061977

To discharge contaminants, being principally sediment, and water to water associated with any operational or maintenance activity relating to the Inlet Canal, Headrace Canal and Water Distribution Race Network, in surface waterbodies listed in Schedules B.1 - B.4. A consent with a duration of 35 years is sought.

Proposed conditions:

1. The discharge of water shall be undertaken in accordance with a sediment management plan prepared to minimise sediment suspension and transport during the operation and maintenance of the scheme.
2. A sediment management plan shall be submitted to the Canterbury Regional Council prior to the commissioning of the scheme. This plan shall set out how the sediment control systems will be operated and maintained to ensure compliance with conditions of this consent. The plan shall include but not necessarily be limited to:
 - (a) Design plans of sediment collection and discharge systems.
 - (b) Details of the operational and maintenance activities that will occur on site.
3. This consent is subject to the conditions listed in Schedule 2: Administrative Conditions

CRC061978

To discharge surplus water and contaminants from the headrace canal and water distribution race network to land, in circumstances where it may enter groundwater and to water at the locations listed in schedules B.1 - B.4. A consent with a duration of 35 years is sought.

Proposed conditions:

1. The discharge shall not result in significant erosion of the bed or banks of any watercourse.
2. This consent is subject to the conditions listed in Schedule 2: Administrative Conditions.

CRC061980

To discharge water that has been diverted, but not taken, back into the Rakaia River, via sediment sluicing, fish pass and bypass channels that form part of the Rakaia water intake system. A consent with a duration of 35 years is sought.

Proposed conditions:

1. The discharge shall not cause significant erosion of the bed or banks of any watercourse.
2. Sediment sluicing shall only be undertaken when the flow in the Rakaia River as measured at Fighting Hill exceeds 300 cubic metres per second, except that this limit does not apply during the months January to April inclusive.
3. Warning signs shall be erected in the riverbed downstream of the intakes as directed by the Canterbury Regional Council.
4. Sediment sluicing shall be undertaken at a time of day determined in consultation with the Canterbury Regional Council.
5. This consent is subject to the conditions listed in Schedule 2: Administrative Conditions.

CRC061981

To discharge water that has been diverted but not taken, back into the Waimakariri River, via sediment sluicing, fish pass and diversion channels that form part of the upper Waimakariri water intake system, A consent with a duration of 35 years is sought.

Proposed conditions:

1. The discharge shall not cause significant erosion of the bed or banks of any watercourse.
2. Sediment sluicing shall only be undertaken when the unmodified flow in the Waimakariri River exceeds 100 cubic metres per second, except that this limit does not apply during the months January to April inclusive.
3. Warning signs shall be erected in the riverbed downstream of the intakes as directed by the Canterbury Regional Council.
4. Sediment sluicing shall be undertaken at a time of day determined in consultation with the Canterbury Regional Council.
5. This consent is subject to the conditions listed in Schedule 2: Administrative Conditions.

CRC061982

To discharge water that has been diverted but not taken, back into the Waimakariri River, via sediment sluicing, fish pass and diversion channels that form part of the lower Waimakariri water intake system. A consent with a duration of 35 years is sought.

Proposed conditions:

1. The discharge shall not cause erosion of the bed or banks of any watercourse.
2. This consent is subject to the conditions listed in Schedule 2: Administrative Conditions.
3. Sediment sluicing shall only be undertaken when the unmodified flow in the Waimakariri River exceeds 100 cubic metres per second.
4. Warning signs shall be erected in the riverbed downstream of the intakes as directed by the Canterbury Regional Council.
5. Sediment sluicing shall be undertaken at a time of day determined in consultation with the Canterbury Regional Council.

CRC061983

To discharge stormwater, which may contain contaminants, from all structures associated with the Central Plains Water Enhancement Scheme into a river, lake or artificial watercourse, including the Waimakariri River and Rakaia River and the waterbodies listed in Schedules B.1 - B.4 and C.1 - C.4. A consent with a duration of 35 years is sought.

Proposed conditions:

1. This consent is subject to the general conditions listed in Schedule 2: Administrative Conditions.
2. The discharge shall be only stormwater from hardstanding and unpaved surfaces at facilities associated with the Central Plains Water Enhancement Scheme.
3. A stormwater management plan for the scheme post construction for stormwater treatment and disposal shall be submitted to the Canterbury Regional Council prior to the commissioning of the scheme. This plan shall set out how the system will be operated and maintained to ensure compliance with conditions of this consent. The plan shall include but not necessarily be limited to:
 4. Design plans of stormwater collection and discharge systems.
 5. Details of the activities that will occur on site.
 6. Any hazardous chemicals (including fuel and oils) that will be held on site and their storage requirements.

CRC072766

A discharge permit to discharge contaminants to air from the operation of a diesel generator during construction at the Waimakiriri portal and Waianiwiwa portal. A duration of 10 years is sought.

Proposed conditions:

1. This consent is subject to the conditions listed in Schedule 1: General Conditions.
2. The discharge to air shall occur via a chimney stack above the ridge line of the generator housing.
3. The discharge shall be directed vertically into air and shall not be impeded by any obstruction above the stack which decreases the vertical efflux velocity below that which would occur in the absence of such an obstruction.
4. The concentration of total suspended particulate in combustion gas discharged from the emission stacks, when measured in accordance with the requirements listed in Schedule AQL6 of the Proposed Canterbury Natural Resources Regional Plan, shall not exceed 500 milligrams per cubic metre of air adjusted to 0 Celsius, dry gas basis, 101.3 kilopascals, and 8 % oxygen or 12 % carbon dioxide.
5. The sulphur content of the fuel burnt shall not exceed 2 % by weight.

CRC073313

A discharge permit to discharge contaminants, principally sediment, and water to the Waianiwiwa River near the Waianiwiwa portal during construction of the tunnel. A duration of 10 years is sought.

Proposed conditions:

1. This consent is subject to the conditions listed in Schedule 1: General Conditions.

2. The discharge shall only be water and contaminants (principally suspended solids) produced from the tunnel and related facilities and reasonably necessary to facilitate the construction of the tunnel and related facilities.
3. The discharge shall be treated to an appropriate standard prior to discharge to the Waianiwaniwa River, including through the use of settling pond(s).

CRC061759

To discharge contaminants, being principally dust, to air from construction activities associated with the construction of the dam and reservoir. A consent with a duration of 35 years is sought.

Proposed conditions:

1. This consent is subject to the general conditions listed in Schedule 1: General Conditions, and Schedule 2: Administrative Conditions.
2. The consent holder shall submit to the Canterbury Regional Council at least one month prior to the commencement of works as part of the Environmental Construction Management Plan required by condition 1, a Dust Management Plan outlining the construction practices and procedures to be adopted in order that compliance with the condition of this consent can be achieved and the effects of construction activities are minimised to the greatest extent practicable. The plan shall include, but not be limited to:
3. The extent of the construction activities in relation to area, where dust could be generated.
4. The types of construction methods to be adopted.
5. The mitigation measures to be adopted to minimise the effects of dust beyond the boundary of the construction site.
6. Contact details for the person in charge of the site works.
7. The discharge shall be limited to contaminants arising from the construction, maintenance and operation of the Central Plains Water Enhancement Scheme.
8. All practicable measures shall be taken to limit the duration and frequency that dust associated with construction, operation and maintenance activities is discharged to air.

CRC061762

To discharge contaminants, being principally dust, to air from construction activities along the routes of the Inlet Canal, Headrace Canal, and Water Distribution Race Network, including pump stations as listed in Schedule A8, and at the sites listed in Schedules A.2 - A.4. A consent with a duration of 35 years is sought.

Proposed conditions:

1. This consent is subject to the general conditions listed in Schedule 1: General Conditions, and Schedule 2: Administrative Conditions.
2. The consent holder shall submit to the Canterbury Regional Council at least one month prior to the commencement of works as part of the Environmental

Construction Management Plan required by condition 1, a Dust Management Plan outlining the construction practices and procedures to be adopted in order that compliance with the condition of this consent can be achieved and the effects of construction activities are minimised to the greatest extent practicable. The plan shall include, but not be limited to:

3. The extent of the construction activities in relation to area, where dust could be generated.
4. The types of construction methods to be adopted.
5. The mitigation measures to be adopted to minimise the effects of dust beyond the boundary of the construction site.
6. Contact detail for the person in charge of the site works.
7. The discharge shall be limited to contaminants arising from the construction, maintenance and operation of the Central Plains Water Enhancement Scheme.
8. All practicable measures shall be taken to limit the duration and frequency that dust associated with construction, operation and maintenance activities is discharged to air.

CRC061763

To discharge contaminants, principally dust, to air from any construction or maintenance activity associated with the Rakaia water intake system. A consent with a duration of 35 years is sought.

Proposed conditions:

1. This consent is subject to the general conditions listed in Schedule 1: General Conditions, and Schedule 2: Administrative Conditions.
2. The consent holder shall submit to the Canterbury Regional Council at least one month prior to the commencement of works as part of the Environmental Construction Management Plan required by condition 1, a Dust Management Plan outlining the construction practices and procedures to be adopted in order that compliance with the condition of this consent can be achieved and the effects of construction activities are minimised to the greatest extent practicable. The plan shall include, but not be limited to:
 3. The extent of the construction activities in relation to area, where dust could be generated.
 4. The types of construction methods to be adopted.
 5. The mitigation measures to be adopted to minimise the effects of dust beyond the boundary of the construction site.
 6. Contact detail for the person in charge of the site works.
 7. The discharge shall be limited to contaminants arising from the construction, maintenance and operation of the Central Plains Water Enhancement Scheme.
 8. All practicable measures shall be taken to limit the duration and frequency that dust associated with construction, operation and maintenance activities is discharged to air.

CRC061765

To discharge contaminants, being principally dust, to air from any construction, operational or maintenance activity associated with the upper Waimakariri water intake system and the lower Waimakariri water intake system. A consent with a duration of 35 years is sought.

Proposed conditions:

1. This consent is subject to the general conditions listed in Schedule 1: General Conditions, and Schedule 2: Administrative Conditions.
2. The consent holder shall submit to the Canterbury Regional Council at least one month prior to the commencement of works as part of the Environmental Construction Management Plan required by condition 1, a Dust Management Plan outlining the construction practices and procedures to be adopted in order that compliance with the condition of this consent can be achieved and the effects of construction activities are minimised to the greatest extent practicable. The plan shall include, but not be limited to:
3. The extent of the construction activities in relation to area, where dust could be generated.
4. The types of construction methods to be adopted.
5. The mitigation measures to be adopted to minimise the effects of dust beyond the boundary of the construction site.
6. Contact detail for the person in charge of the site works.
7. The discharge shall be limited to contaminants arising from the construction, maintenance and operation of the Central Plains Water Enhancement Scheme.
8. All practicable measures shall be taken to limit the duration and frequency that dust associated with construction, operation and maintenance activities is discharged to air.

CRC061755

To discharge contaminants to air from construction activities including welding, abrasive blasting, water blasting and painting associated with the construction of the Central Plains Water Enhancement Scheme. A consent with a duration of 35 years is sought.

Proposed conditions:

1. This consent is subject to the general conditions listed in Schedule 1: General Conditions, and Schedule 2: Administrative Conditions.
2. The discharge shall be limited to contaminants arising from construction of the Central Plains Water Enhancement Scheme.
3. The dispersal or deposition of particles shall not cause an objectionable or offensive effect beyond the boundary of the property where the discharge originates.
4. The total weight of welding rods and solder used at each construction site shall not exceed 250 kilograms per month

CRC061948

To use and store hazardous substances at facilities associated with the construction of the dam and reservoir. A consent with a duration of 35 years is sought.

Proposed conditions:

5. The volume of any storage tank shall not exceed 20,000 litres.
6. Any containment system surrounding a storage tank shall be constructed to have an available retention capacity of at least 120% of the volume of stored material.
7. The containment systems shall be constructed of impermeable material.
8. Design plans of the storage tank and containment system shall be provided to the Canterbury Regional Council prior to works commencing.
9. This consent is subject to the conditions listed in Schedule 2: Administrative Conditions.

CRC072760

A land use consent to excavate a tunnel under the bed of the Hawkins River and tributaries, at or about map reference NZMS 260 L35: 278-578, near Bluff Road. A duration of 35 years is sought.

Proposed conditions:

1. This consent is subject to the conditions listed in Schedule 1: General Conditions.

Schedule 1: General Conditions

General Conditions

1. All works shall be undertaken in general accordance with the application documents presented except as modified by specific conditions.
2. All practicable measures shall be undertaken to minimise adverse effects on property amenity values, wildlife, vegetation and ecological values. This shall include but not be limited to spillage or discharge of hazardous substances into watercourses, stormwater discharges from construction sites, and prevention of contamination of land or groundwater resources. Particular regard shall be given to avoiding disturbance of bird life, waterfowl or their nests, spawning fish and redds, and the stranding of fish in pools or river braids.
3. The consent holder shall submit to the Canterbury Regional Council, attention RMA Compliance and Enforcement Manager, at least one month prior to the commencement of works, an Environmental Construction Management Plan (ECMP) outlining the construction activities and all practices and procedures to be adopted in order that compliance with the conditions of this consent can be achieved and the effects of construction activities are minimised to the greatest extent practicable. The ECMP will be the over-arching document for environmental compliance. Within the ECMP there will be the following sub-plans to address specific issues:
 - (a) Stormwater and wastewater management plan
 - (b) Dewatering management plan
 - (c) Hazardous substances management plan
 - (d) Noise and vibration management plan
 - (e) Dust management plan
 - (f) Traffic management plan
 - (g) Landscape and rehabilitation management plan
 - (h) Remediation action plan
 - (i) Pest management plan
 - (j) Weed management plan
 - (k) Erosion management plan
 - (l) Archaeological management plan
 - (m) Health and safety management plan
 - (n) Waste management plan
4. The consent holder may, at any time, submit to the consent authority, an amended Environmental Construction Management Plan provided it is for the purpose of improving the efficiency and/or quality of the construction works, or better avoiding, mitigating or remedying adverse effects.
5. The consent holder shall notify the consent authorities in writing of the proposed date of commencement of the construction works, at least one month prior to the start date of the works.

6. Where activities involve works in the beds and margins of rivers or water courses, the consent holder shall ensure:
- (a) Fish and Game New Zealand - Central South Island Region and The Department of Conservation shall be notified of the intention to carry out works, and their intended type and scope that are likely to cause significant disturbance of fish and bird life, not less than 48 hours prior to their commencement.
 - (b) All practicable steps shall be undertaken to:
 - (i) keep to established tracks and stream crossings; and
 - (ii) prevent debris, soil, vegetation getting into the watercourse.
 - (c) The activity shall not restrict the access to flood control structures or flood control vegetation for the purposes of their repair or maintenance.
 - (d) Prior to any works being carried out, the consent holder shall ensure that:
 - (i) a suitably qualified person inspects the proposed area of works, and locates any breeding or nesting sites of birds that are threatened species identified as such in the Department of Conservation's "New Zealand Threat Classification System Lists 2002" or any subsequent update of these lists;
 - (ii) any person carrying out works authorised by this consent is advised of any bird breeding or nesting sites located in accordance with (i).
 - (e) Instream works shall, subject to clause (i) below, only be undertaken during the period 1 October to 30 March; or
 - (i) works may be undertaken at any time outside the period specified in sub-condition (e) above, only when the Canterbury Regional Council has notified the consent holder that it is satisfied from a report by a suitably qualified person engaged by the consent holder that the effects of the proposed works on fish spawning and spawning habitat will not be more than minor.
 - (f) The activities and any associated equipment, materials, or debris shall not obstruct or alter the passage of water in a manner that causes:
 - (i) Any increase in the risk or potential for flooding of surrounding lands;
 - (ii) Any destabilising of lawfully established flood control structures or flood control structures or any other lawfully established structures within the beds of rivers;
 - (iii) Any increase in erosion of river beds or banks;
 - (g) The works shall not prevent the passage of fish, or cause the stranding of fish in pools or channels.
 - (h) No plant species listed in Schedule BLR1 of Chapter 6 "Beds and margins of lakes and rivers" of the Proposed Canterbury Natural Resources Regional Plan shall be planted.
 - (i) Within two months of the completion of the construction works, the consent holder shall supply to the consent authority a complete set of "as-built" plans confirming the location of the works.
 - (j) The consent holder shall within two months of completion of the construction works, issue a notice to the consent authority certifying that all construction

debris or other materials from the construction works, that may pose a hazard to public safety, fishing or recreational activities, has been removed.

- (k) The consent holder shall maintain and keep a complaints register for all aspects of all operations in relation to construction activities. The register shall detail the date, time and type of complaint, cause of the complaint, and action taken by the consent holder in response to the complaint. The register shall be available to the consent authority at all reasonable times.

Accidental Discovery

7. An accidental discovery protocol shall be prepared prior to any construction commencing and copies lodged with the Te Rūnanga o Ngāi Tahu and the Canterbury Regional Council. This protocol shall cover both prehistoric (Maori) and historic sites, and shall be prepared in consultation with the New Zealand Historic Places Trust (NZHPT) Te Rūnanga o Ngāi Tahu and Ngāi Tuahuriri.
8. The protocol shall require assessment by a qualified archaeologist of any potential archaeological site discovered. If such a site is determined to be an archaeological site as defined by the Historic Places Act 1993, then NZHPT and Ngāi Tahu shall be contacted and appropriate responses received before construction work recommences. Then the site shall be recorded, trial excavations carried out followed by more thorough excavation if this is considered necessary by a suitably qualified archaeologist.
9. Where appropriate, all contractors, project managers and stakeholders shall be inducted into the protocol and made aware of their individual responsibilities under the protocol.

Schedule 2: Administrative Conditions

1. The lapsing provisions of Section 125 of the Resource Management Act 1991 shall not apply until after the expiry of ten years from the date of grant of this consent.

Environmental Management Fund

2. The consent holder must establish and administer an Environmental Management Fund to be used by the consent holder to fund, firstly, environmental mitigation required as a result of the effects of the operation of the water enhancement scheme which is not otherwise required by the individual Farm Management Plan or specific consent conditions and, secondly, other environmental management projects within the area affected by the operation of the scheme, including:
 - (a) Fund structure and management;
 - (b) The level of levy (initially at least \$2 per hectare of irrigated land per annum);
 - (c) Criteria for seeking, selecting and approving applications;
 - (d) Criteria for a rebate of the levy to recompense water users for the capital costs of environmental enhancement work on water users' own properties, which is not otherwise required by their Farm Management Plan or the consent conditions (up to 50% rebate of the levy paid by any one water user in any one year).
 - (e) The criteria for increasing the levy over time.
3. Priority, for the distribution and use by the consent holder of the scheme Environmental Management Fund, shall be provided to the following environmental mitigation which is not otherwise required by the individual Farm Management Plans or specific consent conditions:
 - (a) Physical protection of, stock exclusion from, weed management and indigenous vegetation planting along riparian margins and wetlands;
 - (b) Physical protection of, stock exclusion from, and indigenous vegetation planting along riparian margins of rivers and streams;
 - (c) Wetland enhancement and wetland creation, including the development of wetlands along intermittent streams;
 - (d) Permanent protection of wetland areas that could contain mudfish.

Farm Management Plans

4. The use of water from the Central Plains Water Enhancement Scheme for irrigation shall be undertaken in accordance with an individual Farm Management Plan.
5. The Farm Management Plan shall cover the following management areas:
 - (a) Irrigation management
 - (b) Soils management
 - (c) Nutrient management
 - (d) Collected animal effluent management
 - (e) Biodiversity & ecosystem management

- (f) Waterway and riparian management
 - (g) Agrichemical Management
6. The Farm Management Plans shall include the following requirements:
- (a) That all new irrigation infrastructure is designed and installed under the supervision of a suitably qualified professional. The design shall take into account the specific requirements of any individual fragic pallic soils on the property.
 - (b) Sub-condition (a) does not preclude the use of existing irrigation infrastructure for the scheme, provided its use has been certified by a suitably qualified professional.
 - (c) That a nutrient budget is prepared and implemented for all properties receiving water from the Scheme;
 - (d) That mechanisms are implemented to ensure that cattle, pigs, and deer are excluded from Rivers and Wetlands (as defined in the Resource Management Act 1991) adjoining land being irrigated;
 - (e) That any potential mudfish sites, from which cattle, pigs, and deer are not otherwise excluded in terms of (d) above, are surveyed by an appropriately qualified person and,
 - (f) if found to be actual mudfish habitat, then mechanisms are implemented to ensure that cattle, pigs, and deer are excluded from such sites in accordance with (d) above, or an equivalent habitat is provided and the mudfish relocated to the alternative habitat;
 - (g) That, for each property, for each 12 month period ending 30 June:
 - (i) either, it is demonstrated, via the nutrient budget required in (c) above, that the average total nitrogen (fertiliser and effluent) application has been less than 200 kgN/ha/yr; or
 - (ii) or, approved methods are used to undertake calculations or measurements of the average annual concentration of nitrate nitrogen in the soil drainage below the plant root zone and the actions in (iii), (iv) or (v) below are implemented depending on the calculated or measured nitrate concentration. For the purposes of this rule, approved methods shall be:
 - Calculations using either the most recent version of the OVERSEER® model or the most recent version of the Soil Plant Atmosphere Model (SPASMO); or
 - Any other method of calculation or measurement approved by the Canterbury Regional Council.
 - (iii) where the average annual concentration of nitrate nitrogen in the soil drainage water below the plant root zone as calculated in accordance with clause (ii) or measured, for the property exceeds 8 grams per cubic metre, management practices are implemented to reduce the loss of nitrate nitrogen to soil drainage water. These may include but not be limited to:
 - Split applications of fertiliser
 - Timing of fertiliser application to plant growth

- Avoiding application of fertiliser to saturated soil
 - Avoiding applying fertilizer when the soil temperature at 10 cm depth is less than 10°C
- (iv) where the average annual concentration of nitrate nitrogen in the soil drainage water below the plant root zone calculated in accordance with clause (ii), exceeds 12 grams per cubic metre of nitrate nitrogen:
- Nitrification inhibitors, winter cover crops, or appropriate technology or management practice, implemented to reduce the loss of nitrate nitrogen to soil drainage water.
- (v) where the average annual concentration of nitrate nitrogen in the soil drainage water below the plant root zone calculated in accordance with clause (ii) or measured, exceeds 16 grams per cubic metre of nitrate nitrogen:
- The average total nitrogen (fertiliser and effluent) application to that property is limited to 200 kgN/ha/yr.
- (h) That the following records are kept for each property and made available to the consent holder, in a form that is suitable to be made available to Canterbury Regional Council on request:
- (i) Timing and rate of inorganic fertiliser applications;
 - (ii) Timing and rate of nitrification inhibitor applications;
 - (iii) Stocking rates (number and type of animals) on an annual basis; and
 - (iv) Land uses, including timing and type of cultivation activities.
7. The farm management plans will be audited by an independent assessor. For the first two years of receiving scheme water each farm plan will be audited annually. After that time each plan will be independently audited at least once every 5 years. A programme of incentives will be developed, and those achieving full compliance will have longer periods between audits than those who do not. Following each independent audit the water user will receive an audit report and will be required to remedy any problems that are identified.

Community Liaison

8. The consent holder shall, prior to the exercise of these consents, undertake an open, public process to offer membership positions on a Community Liaison Group.
9. The Community Liaison Group shall consist of a maximum of six persons with a preference for representatives who can each demonstrate skills or knowledge in at least one of the following:
- (a) Recreational uses of the Waimakariri River or Rakaia River;
 - (b) Sustainable irrigated agricultural practices;
 - (c) Water quality and sustainable land management;

- (d) Community and/or business in Central Canterbury;
 - (e) Lowland drainage network operation;
 - (f) Management of indigenous biodiversity.
10. The members of the Community Liaison Group shall be offered the opportunity to meet every 6 months, or less frequently as determined by the Community Liaison Group, an annual inspection of the Scheme area, and the provision of any information to which Canterbury Regional Council is entitled by virtue of this consent, at the consent holder's expense.
11. If the Community Liaison Group elects to hold a meeting in accordance with Condition 10, then the Scheme Manager or their nominated representative shall attend the meeting.
12. At least one representative from each of Canterbury Regional Council (in its resource consent regulatory capacity); Canterbury Regional Council (in its river and drainage management capacity); and Selwyn District Council shall be invited to attend meetings.
13. The main purposes of the meetings of the Community Liaison Group are to:
- (a) Provide input and feedback into the preparation, implementation, review and amendment of the Farm Management Plan templates;
 - (b) Be presented by, and discuss with, the consent holder the results of monitoring and reporting as required by the conditions of these consents, including the Annual Environmental Report and the annual overall audit report on compliance with the Farm Management Plans, prepared by the consent holder;
 - (c) Discuss, as far as practicable, any community concerns regarding the operation of the Central Plains Water Enhancement Scheme.
 - (d) Review and recommend to the consent holder projects for the distribution of funds from the environmental levy to environmental mitigation projects in accordance with Condition 2c.
14. In particular, the members of the Community Liaison Group shall be offered the opportunity to review and comment on the initial Scheme Environmental Management Plan and the initial Farm Management Plan templates, the reviews of and any amendments to the Scheme Environmental Management Plan and Farm Management Plan templates, the consent holder's Annual Environmental Report including the annual overall audit report on compliance with the Farm Management Plans. The Community Liaison Group will be provided with the opportunity to submit information to the Canterbury Regional Council annually in relation to the review of the Scheme Environmental Management Plan and the template for the Farm Management Plans.

Lowland Drainage

15. No later than six months prior to the taking of water for the Central Plains Water Enhancement Scheme, the consent holder shall undertake a baseline survey of the lowland drainage systems of the Central Plains, and submit a report to the

Canterbury Regional Council. The report shall as far as is reasonably practicable be based on existing data, and include:

- (a) An inventory of drains and streams, their location, size and capacity,
 - (b) An inventory of sewerage systems (reticulated and individual septic tanks),
 - (c) The conditions of these facilities, their capacities, maintenance activities, dates of installation, histories of water-level related issues,
 - (d) Records of stream and drain flows and groundwater levels,
 - (e) Existing management and administration arrangements for the drainage schemes,
 - (f) Current costs of maintenance and operation of the drainage schemes.
16. The consent holder shall, prior to the taking of water for the Central Plains Water Enhancement Scheme, invite persons as outlined below to form a Drainage Technical Review Panel.
17. The Drainage Technical Review Panel shall consist of a maximum of six persons with a preference for representatives who can demonstrate skills or knowledge in at least one of the following:
- (a) The operation of the Central Plains Water Enhancement Scheme
 - (b) Lowland drainage network operations
 - (c) Groundwater hydrogeology
 - (d) Land drainage
18. The Drainage Technical Review Panel shall comprise at a minimum the following:
- (a) A representative of Central Plains Water Enhancement Scheme management,
 - (b) A representative of drainage schemes management from the lower plains,
 - (c) An engineer with expertise and experience in both large scale and localised solutions to land drainage needs,
 - (d) An engineer or scientist with expertise and experience in Canterbury groundwater systems
 - (e) A representative from the Canterbury Regional Council
19. The main purpose of the Drainage Technical Review Panel is to agree on the cause of drainage situations, possible mitigation measures, the costs thereof and the responsibility for payment. The Panel shall operate on a consensus basis.
20. The consent holder shall also establish a Drainage Disputes Resolution Board that comprises three persons with the following skills and knowledge:
- (a) Expertise and experience in disputes resolution and legal matters
 - (b) Expertise and experience in both large scale and localised solutions to land drainage needs,
 - (c) Expertise and experience in Canterbury groundwater systems

21. The main purpose of the Drainage Disputes Resolution Board shall be to arbitrate in the event of disagreement or failure by the Drainage Technical Review Panel to reach a consensus on drainage related issues.

Review

22. The Canterbury Regional Council may in the last five working days in June and December during the first five years from the date of issue of this consent, or until the completion of construction works and thereafter annually on the last five working days of June each year serve notice of its intention to review the conditions of this consent for the purpose of:

- (a) dealing with any adverse effects on the environment which may arise from the exercise of this consent;
- (b) ensuring the adequacy of sampling and/or monitoring programmes;
- (c) dealing with any adverse effects or other issue identified in any report submitted as a condition of this consent.
- (d) altering the rate of abstraction from the Rakaia and/or Waimakariri Rivers to correspond to the actual rate of water usage; and/or
- (e) amending the minimum flow restrictions in the takes from the Rakaia and/or Waimakariri Rivers to reflect any changes in the abstraction rate of the other abstractors from the river.

23. Charges, set in accordance with section 36 of the Resource Management Act 1991, shall be paid to the Regional Council for the carrying out of its functions in relation to the administration, monitoring and supervision of resource consents and for the carrying out of its functions under section 35 of the Act

Schedules of Locations referred to in Canterbury Regional Council Consents.

The following Schedules list the locations of the following:

- Schedule A.1: Waianiwaniwa Dam and storage reservoir
- Schedule A.2: Inlet canal and tunnel from the Waimakariri River to the Waianiwaniwa Reservoir
- Schedule A.3: Headrace canal
- Schedule A.4: Water distribution race network
- Schedule A.5: Rakaia River intake and headworks
- Schedule A.6: Upper Waimakariri River intake and headworks
- Schedule A.7: Lower Waimakariri River (Gorge Bridge) intake and headworks
- Schedules B.1 – B.4: Locations of the dam and divert, river and stream crossings
- Schedules C.1 – C.4: Locations of discharges

SCHEDULE A: Locations of the Proposed Major Facilities for the Central Plains Water Enhancement Scheme

Schedule A.1: Waianiwaniwa Dam and storage reservoir

The proposed Waianiwaniwa Dam will be constructed at the mouth of the Waianiwaniwa valley where it leaves the Malvern Hills between approximate map references NZMS 260 L35: 276-478 and L35: 260-478.

The proposed Waianiwaniwa Reservoir water storage lake will extend about 8.5 kilometres upvalley from the dam, and into the tributary valleys that join the main Waianiwaniwa Valley, at about the 280 m elevation above sea level, and will occupy approximately 12 square kilometres of the valley floor and adjacent hillside slopes.

Schedule A.2: Inlet canal and tunnel from the Waimakariri River to the Waianiwaniwa Reservoir

The proposed inlet canal from the Waimakariri River to the to the Waianiwaniwa Reservoir will follow an approximately 4 km route from the Upper Waimakariri River

intake to be located in the bed of the Waimakariri River at approximate map reference NZMS 260 L35: 254-675, to the tunnel entrance at approximate map reference NZMS 260 L35: 269-637. The tunnel extends approximately 10 km to discharge into the Waianiwaniwa Reservoir at approximate map reference NZMS 260 L35: 283-540.

Schedule A.3: Headrace

The proposed headrace will extend from the Rakaia River intake for approximately 61.4 kilometres across the upper Central Plains following approximately the 235 metre elevation contour line, to the Waimakariri River at the lower Gorge Bridge intake structure. The final location of the headrace will be within the designation zone, as shown on Maps 3 to 6 attached to this application.

The western end of the headrace will start in the bed of the Rakaia River at or about map reference NZMS K36: 071-392, and runs generally southeast for approximately 9 kilometres along the true left side of the Rakaia River, and traverses the terrace faces here to reach the main plains surface at about map reference NZMS L36: 141-328. The route then runs generally east for approximately 4.5 kilometres to cross Rakaia Terrace Road at about map reference NZMS L36: 176-328, and then turns to run generally north for approximately 6 km to cross Leaches Road at about map reference NZMS L36: 188-379, and the Hororata River at about map reference NZMS L36: 196-398. The route then turns to the northeast and follows the 235 m elevation contour along the lower slopes of the Harper Hills for approximately 10 kilometres to cross the Coalgate-Hororata Road at about map reference NZMS 260 L35: 257-457, the Selwyn River at about map reference NZMS 260 L35: 259-461, and State Highway 77 at about map reference NZMS L35: 270-474. The route then runs east-northeast along the lower slopes of the Homebush Ridge for approximately 3.5 kilometres to about map reference NZMS 260 L35: 311-494, where it crosses Deans Road. The route then runs east for approximately 4 kilometres across the plains crossing the Hawkins River at about map reference NZMS 260 L35: 328-493, and State Highway 73 and the Midland Railway line at about map reference NZMS 260 L35: 350-502. It then runs northeast for approximately 5 kilometres to near Bleak House Corner where it crosses the Old West Coast Road at about map reference NZNS 260 L35: 385-535. It then turns to run generally northwest for approximately 8.5 kilometres, traversing the terrace on the true right bank of the Waimakariri River and finishing at the Waimakariri Gorge Bridge intake at about map reference NZMS 260 L35: 328-603.

Schedule A.4: Water distribution race network

The proposed water distribution race network will follow roads or run through private property in the rural areas of the inner Central Plains. The northern boundary runs along the Waimakariri River from about the Kowai River confluence downstream for approximately 35 kilometres, and the southwestern boundary runs along the Rakaia

River from near the Gorge Bridge southeast to the Satate Highway 1 Bridge. The northwestern boundary follows the inner plains margin. The southeastern margin follows State Highway 1 generally northeast from Rakaia to the Selwyn River, and then trends more generally north and north-northeast to the Waimakariri River. Parts of the race network will pass near the settlements of Springfield, Sheffield, Darfield, Kirwee, Coalgate, Hororata, Windwhistle, Te Pirita, and Dunsandel.

Schedule A.5: Rakaia River intake and headworks

The proposed Rakaia River intake and headworks structures will form part of the headrace canal in and adjacent to the bed of the Rakaia River at the following locations.

1. Intake structure in the bed of the Rakaia River at about map reference NZMS 260 K36: 078-387
2. Sediment trap at about map reference NZMS 260 K36:081-384
3. Flow control gate at about map reference NZMS 260 K36:082-381
4. Fish screen and bypass channel at about map reference NZMS 260 K36: 083-379

Schedule A.6: Upper Waimakariri River intake and headworks

The proposed Upper Waimakariri River intake and headworks structures will form part of the inlet canal in and adjacent to the bed of the Waimakariri River at the following locations.

1. Intake structure in the bed of the Waimakariri River at about map reference NZMS 260 L35: 255-667
2. Sediment trap at about map reference NZMS 260 L35: 259-662
3. Flow control gate at about map reference NZMS 260 L35: 082-381
4. Fish screen and bypass channel at about map reference NZMS 260 L35: 261-658

Schedule A.7: Lower Waimakariri River (Gorge Bridge) intake and headworks

The proposed lower Waimakariri River intake and headworks structures will form part of the headrace canal in and adjacent to the bed of the Waimakariri River at the following locations.

1. Intake structures in the bed of the Waimakariri River at about map reference NZMS 260 L35: 328-603
2. Sediment trap at about map reference NZMS 260 L35: 334-592
3. Flow control gate at about map reference NZMS 260 L35: 334-588

4. Fish screen and bypass channel at about map reference NZMS 260 L35:336-583

SCHEDULE B: Locations of proposed Dam and Divert, River and Stream Crossings

Schedule B.1: Waianiwaniwa dam site

It is proposed to dam and divert the Waianiwaniwa River at about map reference NZMS 260 L35: 275-477

Schedule B.2: Inlet Canal to the Waianiwaniwa Reservoir

The proposed route of the inlet canal will cross rivers and streams at the following locations.

1. Kowai River at about map reference NZMS 260 L35: 267-649
2. Kowai River at about map reference NZMS 260 L35: 265-651

Schedule B.3: Headrace canal

The proposed route of the headrace canal will cross rivers and streams at the following locations.

1. Hororata River at about map reference NZMS 260 L36: 196-398
2. Selwyn River at about map reference NZMS 260 L35: 259-461
3. Hawkins River at about map reference NZMS 260 L35: 328-493
4. Cordys Stream at about map reference NZMS 260 L35: 215-421
5. Unnamed tributary of Hororata River at about map reference NZMS 260 L35: 198-408
6. Unnamed tributary of Hororata River at about map reference NZMS 260 L35: 204-409
7. Unnamed tributary of Hororata River at about map reference NZMS 260 L35: 205-409
8. Unnamed tributary of Hororata River at about map reference NZMS 260 L35: 209-414
9. Unnamed tributary of Hororata River at about map reference NZMS 260 L35: 211-417
10. Unnamed tributary of Hororata River at about map reference NZMS 260 L35: 220-422

11. Unnamed tributary of Hororata River at about map reference NZMS 260 L35: 223-428
12. Unnamed tributary of Hororata River at about map reference NZMS 260 L35: 226-428
13. Unnamed tributary of Hororata River at about map reference NZMS 260 L35: 227-428
14. Unnamed tributary of Hororata River at about map reference NZMS 260 L35: 233-433
15. Unnamed tributary of Hororata River at about map reference NZMS 260 L35: 237-434
16. Unnamed tributary of Selwyn River at about map reference NZMS 260 L35: 247-448
17. Unnamed tributary of Selwyn River at about map reference NZMS 260 L35: 247-250
18. Unnamed tributary of Selwyn River at about map reference NZMS 260 L35: 252-451
19. Unnamed tributary of Waianiwaniwa River at about map reference NZMS 260 L35: 283-480
20. Unnamed tributary of Waianiwaniwa River at about map reference NZMS 260 L35: 276-476
21. Unnamed tributary of Waianiwaniwa River at about map reference NZMS 260 L35: 294-486
22. Unnamed tributary of Waianiwaniwa River at about map reference NZMS 260 L35: 297-481
23. Unnamed tributary of Waianiwaniwa River at about map reference NZMS 260 L35: 306-488
24. Unnamed tributary of Waianiwaniwa River at about map reference NZMS 260 L35: 287-482
25. Blacks Stream at about map reference NZMS 260 L35: 309-494

Schedule B.4: Water distribution race network

The proposed routes of the water distribution race network will cross rivers and streams at the following locations.

1. Unnamed Tributary of the Hororata River at about map reference NZMS L35: 058-425
2. Unnamed Tributary of the Hororata River at about map reference NZMS L35: 074-429
3. Unnamed tributary of Hororata River at about map reference NZMS 260 L36: 141-378
4. Unnamed tributary of Hororata River at about map reference NZMS 260 L36: 154-383

5. Unnamed tributary of Hororata River at about map reference NZMS 260 K35: 096-399
6. Unnamed tributary of Hororata River at about map reference NZMS 260 L35: 105-401
7. Unnamed tributary of Hororata River at about map reference NZMS 260 L35: 122-409
8. Unnamed tributary of Selwyn River at about map reference NZMS 260 L35: 263-443
9. Unnamed tributary of Selwyn River at about map reference NZMS 260 L35: 260-456
10. Unnamed tributary of Rakaia River at about map reference NZMS 260 L36: 266-224
11. Unnamed tributary of Rakaia River at about map reference NZMS 260 L36: 271-236
12. Irwell River at about map reference NZMS 260 L36: 420-296
13. Irwell River at about map reference NZMS 260 L36: 423-296
14. Irwell River at about map reference NZMS 260 L36: 425-296
15. Irwell River at about map reference NZMS 260 L36: 426-296
16. Irwell River at about map reference NZMS 260 L36: 432-295
17. Hawkins River at about map reference NZMS 260 L35: 360-414
18. Unnamed Tributary of the Hawkins River at about map reference NZMS 26 L35: 229-599
19. Unnamed Tributary of the Hawkins River at about map reference NZMS 26 L35: 228-592
20. Unnamed Tributary of the Hawkins River at about map reference NZMS 26 L35: 230-601
21. Unnamed Tributary of the Hawkins River at about map reference NZMS 26 L35: 233-601
22. Unnamed Tributary of the Hawkins River at about map reference NZMS 26 L35: 244-598
23. Unnamed Tributary of the Hawkins River at about map reference NZMS 26 L35: 253-589
24. Unnamed Tributary of the Hawkins River at about map reference NZMS 26 L35: 260-606
25. Unnamed Tributary of the Hawkins River at about map reference NZMS 26 L35: 257-619
26. Unnamed Tributary of the Hawkins River at about map reference NZMS 26 L35: 248-627

SCHEDULE C: Location of Discharges

Schedule C.1: Rakaia River headworks discharges

1. Sediment sluice race discharge at about map reference NZMS 260 K36: 081-381
2. Fish bypass channel at about map reference NZMS 260 K36: 083-378

Schedule C.2: Waimakariri River headworks discharges

1. Upper Intake sediment sluice race discharge at about map reference NZMS 260 L35: 262-659
2. Upper intake fish bypass channel at about map reference NZMS 260 L35: 263-657
3. Lower (Gorge Bridge) intake sediment sluice race discharge at about map reference NZMS 260 L35: 344-588
4. Lower (Gorge Bridge) intake fish bypass channel at about map reference NZMS 260 L35: 344-588

Schedule C.3: Operational bywash discharges

Operational bywash discharges will occur from water distribution races at the following locations.

1. Race D 2 to a wetland adjacent to the Selwyn River at about map reference NZMS 260 L36: 456-301,
2. Race D 2.1 to a wetland adjacent to the Waimakariri River at about map reference NZMS 260 M35: 523-490
3. Race D 2.2 to a wetland adjacent to the Waimakariri River at about map reference NZMS 260 M35: 539-488
4. Race D 2.3 to a stockwater race at about map reference NZMS 260 M36: 524-371
5. Race D 3 to a wetland adjacent to the Selwyn River at about map reference NZMS 260 L36: 441-305
6. Race SP 2.5 to a wetland adjacent to the Hawkins River at about map reference NZMS 260 L35: 281-574
7. Race C 1 to a wetland adjacent to the Hawkins River at about map reference NZMS 260 L36: 394-330
8. Race C 2 to a wetland adjacent to the Waianiwaniwa River at about map reference NZMS 260 L36: 351-358
9. Race C 3 to a wetland adjacent to the Selwyn River at about map NZMS 260 L36: 350-345
10. Race C 3.1 to a wetland adjacent to the Selwyn River at about map NZMS 260 L35: 289-421

11. Race TP 1 to a wetland adjacent to the Selwyn River at about map NZMS 260 L36: 435-299
12. Race TP 2.6 to a wetland adjacent to the Rakaia River at about map NZMS 260 L36: 329-184

Schedule C.4: Emergency bywash discharges

Emergency bywash discharges will occur from water distribution races at the following locations.

1. Race D 2 to a wetland adjacent to the Selwyn River at about map reference NZMS 260 L36: 456-301,
2. Race D 2.1 to a wetland adjacent to the Waimakariri River at about map reference NZMS 260 M35: 523-490
3. Race D 2.1.1 to the Waimakariri River at about map reference NZMS 260 L35: 477-496
4. Race D 2.2 to a wetland adjacent to the Waimakariri River at about map reference NZMS 260 M35: 539-488
5. Race D 3 to a wetland adjacent to the Selwyn River at about map reference NZMS 260 L36: 441-305
6. Race C 1 to a wetland adjacent to the Hawkins River at about map reference NZMS 260 L36: 394-330
7. Race C 2 to a wetland adjacent to the Waianiwaniwa River at about map reference NZMS 260 L36: 351-358
8. Race C 3 to a wetland adjacent to the Selwyn River at about map NZMS 260 L36: 350-345
9. Race TP 1 to a wetland adjacent to the Selwyn River at about map NZMS 260 L36: 435-299
10. Race TP 1.1 to the Hororata River at about map NZMS 260 L36: 337-334
11. Race TP 2.6 to a wetland adjacent to the Rakaia River at about map NZMS 260 L36: 329-184
12. Race TP 3.2 to the Rakaia River at about map NZMS 260 L36: 264-219

Proposed Conditions for Selwyn District Council Consents

Land Use Conditions common to Windwhistle, Springfield, Sheffield, Darfield, Te Pirita and Central zones:

1. General

1.1 Lapsing provision

1.1.1 The lapsing provisions of Section 125 of the Resource Management Act 1991 shall not apply until after the expiry of ten years from the date of grant of this consent.

1.2 Scope of works

1.2.1 Except where modified by specific conditions set out below, the scheme and all incidental work shall be constructed, operated and maintained generally in accordance with the details contained in following documents,:

- Central Plains Water Enhancement Scheme;
- Application for Land Use Consent– Annexure A;
- Assessment of Effects on the Environment, Section 3 Description of the Proposed Activities
- Application for Land Use Consent– Annexure D
- Application for Land Use Consent– Annexure E

1.3 Hours of Work

1.3.1 The hours of construction work shall be unrestricted except as set out below:

- a. Work on the distribution network shall be limited to 0630-2000, Monday to Saturday inclusive and excluding any public holiday within 200m of any residential dwelling, except where agreed to by the applicable property owners.
- b. Notwithstanding the above restriction, concrete pouring and associated activities can occur at any time.

1.4 Annual Environment Report

1.4.1 An Annual Environmental Report is to be submitted on each anniversary of the date of commencement of this consent, until commissioning is complete. The matters to be covered shall include:

- a. A description of the works (including construction, mitigation, rehabilitation, monitoring and reporting) carried out in the preceding 12 months.

- b. An explanation of any departure in the preceding 12 months from the previous Annual Environmental Report.
- c. A description of all construction, mitigation, rehabilitation, monitoring and reporting intended to be carried out in the next 12 months with an approximate timetable of activities.
- d. A description and analysis of any unexpected adverse effect on the environment that has arisen as a result of the exercise of these consents in the last 12 months, the steps taken in response to that effect, and the results of those steps.
- e. A record of complaints received in the last 12 months and the mitigation measures adopted.

1.5 Environmental Construction Management Plan

1.5.1 The consent holder shall submit to the Selwyn District Council, at least one month prior to the commencement of works, an Environmental Construction Management Plan (ECMP) outlining the construction activities and all practices and procedures to be adopted in order that compliance with the conditions of this consent can be achieved and the effects of construction activities are minimised to the greatest extent practicable. The ECMP will be the over-arching document for environmental compliance. Within the ECMP there will be the following sub-plans to address specific issues:

- a. Stormwater and wastewater management plan
- b. Dewatering management plan
- c. Hazardous Substances management plan
- d. Noise management plan
- e. Dust management plan
- f. Traffic management plan
- g. Landscape and Rehabilitation management plan
- h. Remediation action plan
- i. Pest management plan
- j. Weed management plan

- k. Erosion management plan
- l. Archaeological management plan
- m. Health and safety management plan
- n. Waste management plan

1.6 Construction Programme

1.6.1 A construction programme, including timetable, sequence of events and duration, shall be submitted to the Selwyn District Council at least one month prior to the commencement of works.

1.7 Other Approvals

1.7.1 Details of all necessary permissions required and or obtained under other legislation (e.g., Historic Places Act, Reserves Act) shall be supplied to the Selwyn District Council at least one month prior to the commencement of works.

1.8 Amended Management Plans

1.8.1 The consent holder may, at any time, submit to the Selwyn District Council an amendment to any of the Management Plans referred to and required by the conditions for the purposes of improving the efficiency and/or quality of the construction works, or better avoiding, mitigating or remedying adverse effects which may arise as a result of undertaking the works.

1.9 As Built Plans

1.9.1 Within two months of the completion of the construction works for any of the major components of the Central Plains Water Enhancement Scheme, the consent holder shall supply the Selwyn District Council with a complete set of "as built" plans confirming the location of the works.

1.10 Complaints Register

1.10.1 The consent holder shall maintain and keep a complaints register for all aspects of all operations in relation to construction activities. The register shall include the complaints registers required for the specific management plans specified in the conditions below as well as any other complaints received and shall detail the date, time and type of complaint, cause of the complaint, and action taken by the consent holder in response to the complaint. The register shall be available to the Selwyn District Council at all reasonable times.

2. Traffic Management

2.1 Road/Rail Crossings

2.1.1 The Midland rail line (Rolleston – Greymouth) shall remain open at all times.

2.1.2 The design of any road/rail/race crossing shall meet the relevant sight distances specified in Appendix 10 of the Rural Section of the proposed Selwyn District Plan. Transit New Zealand's Standards and Guideline Manual (SP/M/021), Planning and Policy Manual (SP/M001) and State Highway Geometric Design Manual (SP/M024) for safe stopping distances, safe passing distances, intersection entry sight distances and clear zone distances to hazards.

2.2 Construction Traffic

2.2.1 Prior to construction, a Traffic Management Plan shall be prepared and a copy given to the Selwyn District Council and Transit New Zealand. This management plan shall be complied with at all times and it shall include the following provisions:

- a. On all public roads, signs shall be erected warning motorists of a haul road intersection giving rise to a hazard due to heavy trucks crossing.
- b. Warning signs shall be erected at intersections of all haul roads and public roads prohibiting public access to the construction zone.
- c. Stock crossing methods shall be established after consulting with local farmers.
- d. Local emergency services shall be notified of all temporary local road closures.
- e. All construction vehicles shall be fitted with, and use flashing lights while operating in the construction zone and on haul roads.
- f. All construction vehicles shall comply with the Land Transport Safety Authority rule for vehicle dimensions and mass on public roads, unless specific over dimension permits are obtained.
- g. Movement of oversize vehicles and equipment on SH 1, SH73 and SH 77 shall comply with Transit New Zealand requirements.
- h. Road signs shall be erected on roads where necessary to warn motorists of the hazard caused by fog or frost. The design and location of such signs shall be approved by Transit New Zealand for SH1, SH73 and SH77, or the Selwyn District Council for all other roads.

- i. Road safety audits shall be carried out every six months of traffic signals/stop signs controlling the intersections of all public roads with haul roads. The results of those audits shall be reviewed and steps taken to ensure motorists do not suffer unreasonable delays. Regular monitoring of traffic signals to ensure any faults are identified and repaired.
- j. Measures for dust suppression to mitigate the effects of dust.
- k. Measures to maintain vehicles and machinery to mitigate the effects of fumes.

2.3 Haul Roads – Intersections with State Highways 73 and 77

2.3.1 Where any haul road intersects with a State Highway, the construction and operation of the intersections shall comply with the following:

- a. Prior to construction, a Traffic Management Plan dealing with State Highway intersections with haul roads shall be prepared which complies with the Transit New Zealand Code of Practice for Temporary Traffic Management. A copy of this plan shall be provided to Transit New Zealand prior to construction commencing.
- b. Where any haul road intersects any State Highway, the haul road shall be constructed to a maximum width of 15m, with a speed limit imposed on haul road traffic of 30 km/hr.
- c. Where any project haul road intersects any State Highway, sight distances both ways shall comply with the requirements of Tables 5A and 5B set out in Appendix 10 of the Proposed Selwyn District Plan (Rural Volume).
- d. Dust suppressant shall be applied to any haul road when required within 100 metres of an intersection with State Highway to ensure dust does not reduce the visibility for drivers approaching the intersection.

2.4 Haul Roads – Intersection with Selwyn District Council Roads

2.4.1 Where any haul road intersects with any formed legal roads other than a State Highway, the construction and operation of the intersection shall comply with the following:

- (a) Prior to construction, a Traffic Management Plan shall be prepared which complies with the Transit New Zealand Code of Practice for Temporary Traffic Management. A copy of this plan shall be provided to the Selwyn District Council prior to construction commencing.

- (b) Stop signs shall be erected and maintained to control intersections between all formed public roads any haul road.
- (c) Where any haul road intersects with any formed public road, the haul road shall be constructed to a maximum width of 15m, with a speed limit imposed on haul road traffic of 30 km/hr.
- (d) Where any project haul road intersects any formed public road, sight distances both ways shall comply with the requirements of Tables 5A and 5B set out in Appendix 10 of the Proposed Selwyn District Plan (Rural Section).
- e. Dust suppressant shall be applied to any haul roads when required within 100 metres of an intersection with any formed public road to ensure dust does not reduce the visibility of drivers approaching the intersection.

3. River Access

3.1 Maintenance of River Access

3.1.1 Where existing public access to a river is restricted as a result of construction works subject to this application, the consent holder or its contractors shall provide alternative access to an equivalent standard in a location as near as practicable to the existing access point.

4. Public Safety/Health and Safety

4.1 Health and Safety Management Plan

4.1.1 Prior to any construction the consent holder shall develop and implement a Health and Safety Management Plan for both construction and operation of the Central Plains Enhancement Scheme which shall be provided to the Selwyn District Council, and shall be complied with on an ongoing basis. The Plan shall include at least the following:

Construction

- a. Ensuring contractors comply with relevant construction regulations and codes of practice.
- b. Ensuring contractors assess hazards on site and develop appropriate control plans that incorporate public health and safety requirements and incorporate public risk mitigation prior to engagement/ commencement of construction. This includes the provision of fencing and warning signs where appropriate to keep the public safe from harm, and to prevent unauthorised access of people and stock into areas where hazards exist including, borrow areas, fill areas and haul roads.

- c. Public and stakeholder consultation, education and information sharing.
- d. Contractor and sub-contractor management.
- e. Public notification of the area of any blasting activities.
- f. Induction/training requirements.
- g. Emergency protocols/requirements, including arrangements for 24 hour emergency vehicle access (eg Civil Defence, Ambulance, Fire Service and Police).
- h. Incident reporting procedures.
- i. Appropriate hazard warnings (eg signs, sirens).

Operation

- j. Procedures to review and update the Plan as required.
- k. How to deal with emergency events such as oil spills, earthquakes, fires and floods.

4.1.2 As part of implementing the Health and Safety Management Plan, the consent holder shall:

- a. Identify contingency events/document associated emergency response plans.
- b. Make the plan available to relevant parties (eg councils, employees, civil defence, residents, etc).

4.2 Access during Construction

4.2.1 During construction, public access will be restricted to all construction, cut, fill and borrow areas by the use of suitable fences/barriers, with warning signs erected and maintained at appropriate locations.

5. Landscape and Rehabilitation

5.1 Landscape and Rehabilitation Management Plan

5.1.1 The consent holder shall prepare a Landscape and Rehabilitation Management Plan which shall be lodged with the Selwyn District Council prior to the commencement

of construction works. Land restoration following construction must adhere to the Landscape and Rehabilitation Management Plan which shall apply to all areas within which construction occurs for the purpose of establishing the proposed distribution races, but outside of those areas of riverbed which are under the control of the Canterbury Regional Council and thus the subject of resource consents administered by the Regional Council.

5.1.2 The Landscape and Rehabilitation Management Plan shall cover the following areas and/or projects:

- a. the construction zone generally where land has been disturbed;
- b. race embankments;
- c. Construction storage areas.

5.1.3 The Landscape and Rehabilitation Management Plan shall contain:

- a. Specifications for the use of recessive colours for all structures (all colours shall have a reflectivity of less than 40%)
- b. final contours and finished heights of earthworks;
- c. methods for stripping, storing and re-use of topsoil;
- d. proposed planting – species, location and timing;
- e. 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 on a plan;
- f. the staging of vegetation removal;
- g. rehabilitation of haul roads;
- h. methods and protocols for educating and training contracting personnel about the requirements of the Landscape and Rehabilitation Management Plan.

5.1.4 All water race embankments shall be re-grassed.

5.1.5 Within two months of completion of any component of the construction works, the consent holder shall issue a notice to the Selwyn District Council certifying that all construction debris or other materials from the construction works that may pose a hazard to public safety or recreational activities have been removed.

6. Noise and Vibration

6.1 Construction Noise Limits

6.1.1 All construction activity shall be conducted so that noise emissions do not exceed the noise limits in the following table. Sound levels shall be measured and assessed in accordance with the provisions of NZS 6803:1999 "Acoustics – Construction Noise". These limits shall apply at all occupied residential units and schools. The consent holder shall liaise with all schools and avoid construction noise during any particularly sensitive times.

Time of week	Time period	Duration of work					
		Typical duration (dBA)		Short-term duration (dBA)		Long-term duration (dBA)	
		L _{eq}	L _{max}	L _{eq}	L _{max}	L _{eq}	L _{max}
Weekdays	0630-0730	60	75	65	75	55	75
	0730-1800	75	90	80	95	70	85
	1800-2000	70	85	75	90	65	80
	2000-0630	45	75	45	75	45	75
Saturdays	0630-0730	45	75	45	75	45	75
	0730-1800	75	90	80	95	70	85
	1800-2000	45	75	45	75	45	75
	2000-0630	45	75	45	75	45	75

Sundays and public holidays	0630-0730	45	75	45	75	45	75
	0730-1800	55	85	55	85	55	85
	1800-2000	45	75	45	75	45	75
	2000-0630	45	75	45	75	45	75

6.2 Noise and Vibration Management Plan

6.2.1 Prior to the commencement of any construction activity, the consent holder shall appoint an appropriately qualified acoustic engineer to prepare a Noise and Vibration Management Plan. That plan shall be lodged with the Selwyn District Council and adhered to during construction

6.2.2 The Noise and Vibration Management Plan shall include;

- (a) all applicable noise limits;
- (b) procedures for identifying dwellings within 150 metres of the headrace, 250 metres of bridges/siphons/piling, 75 metres of the distribution network, and 500 metres of any blasting;
- (c) mitigation options that will be adopted as required to comply with the noise limits;
- (d) procedures to be followed for monitoring of noise during construction works;
- (e) procedures for conducting pre and post construction structural checks for building within the vibration buffer distances,
- (f) liaison and complaint procedures. The complaint procedure shall require investigation of complaints within twenty-four hours, and immediate cessation of any construction activity found to be breaching the noise limits.

6.3 Operational Noise Limits

6.3.1 All operational noise from the scheme shall comply with the following noise limits when measured in accordance with NZS 6801:1991 "Measurement of Sound" and assessed in accordance with NZS 6802:1991 "Assessment of Environmental Sound":

6.3.2 Within the notional boundary of any dwelling, rest home, hospital, or classroom in any educational facility, except where that dwelling, rest home, hospital or classroom is located within a Living Zone:

- 0730 to 2000 hrs 60 dBA L₁₀
- 2000 to 0730 hrs 45 dBA L₁₀, 70 dBA L_{max}

Within any site boundary in a Living Zone:

- 0730 to 2000 hrs 55 dBA L₁₀
- 2000 to 0730 hrs 40 dBA L₁₀, 70 dBA L_{max}

7. Farms

7.1 Access to Canals and Races

7.1.1 The consent holder shall erect and maintain stock fences between the Central Plains Enhancement Scheme works and adjacent farms to prevent cattle accessing the main headrace canal, or any inlet canal.

7.2 Restoration Work

7.2.1 Where the works affects land or chattels, the consent holder shall reconfigure, relocate, or restore all existing:

- a. fences;
- b. irrigation facilities;
- c. farm lanes/tracks;
- d. buildings; and
- e. landscaping;

This includes providing bridges or alternative structures where necessary to maintain viable lanes/tracks or irrigation facilities.

8. Significant Indigenous Vegetation

8.1 Significant Indigenous Vegetation Protection Plan

8.1.1 Prior to any construction occurring, the consent holder shall, in consultation with Selwyn District Council, produce a Significant Indigenous Vegetation Protection Plan and adhere to this on an ongoing basis. This plan shall:

- (a) identify and map any significant indigenous vegetation that has the potential to be destroyed or adversely affected by construction activities
- (b) determine appropriate methods of protecting the plants from damage, or if that is not possible, mitigating the effects of the loss of plants by methods such as transplanting, or re-seeding nearby areas.

9. Dust

9.1 Control of Dust

9.1.1 All practicable measures shall be taken to limit the extent, duration and frequency of dust discharges from construction, operation and maintenance activities.

9.2 Dust Management Plan

9.2.1 Prior to any construction, the consent holder shall prepare a Dust Management Plan which shall be provided to the Selwyn District Council, and adhered to during construction. This plan shall cover:

- a. methods of dust suppression to minimise the effects of dust beyond the boundary of the construction site, including, but not limited to, use of sprinklers and water carts, and revegetation of stockpiles where appropriate;
- b. dust monitoring;
- c. nomination of an employee/contractor to be responsible for consulting with local residents about dust during construction;
- d. identification of areas within 100m of any construction site 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;
- e. regular public road maintenance to ensure optimal surface conditions;

9.3 Complaints

9.3.1 During construction, the consent holder shall maintain a complaints register dealing with dust. The register shall detail the date, time and type of complaint, cause of the complaint, and action taken by the consent holder in response to the complaint. The register shall be available to the consent authorities at all reasonable times.

10. Waste Management and Hazardous Substances

10.1 Remediation Action Plan

10.1.1 A Remediation Action Plan for contaminated areas will be prepared and lodged with the Selwyn District Council prior to any construction activity and adhered to where the construction of any works subject to the application requires the disturbance or removal of any

- a. landfill;
- b. farm dump;
- c. offal pit;
- d. septic tank;
- e. silage pits; and
- f. dairy effluent disposal ponds.

10.1.2 The Remediation Action Plan above shall address the matters set out in (a) - (f) below, with a level of detail appropriate to the degree of risk presented by the disturbance or removal of each specific contaminated area:

- a. The earthworks and transport controls to minimise the off-site mitigation of contamination (via air or water during the remedial works).
- b. Appropriate measures for the control of dust or odour;
- c. The diversion of stormwater away from the remedial works;
- d. The treatment of contaminated stormwater or groundwater in the remediation area;
- e. Sampling and reporting;
- f. The health and safety requirements for remediation workers

10.2 Solid Waste

10.2.1 A Waste Management Plan shall be prepared and lodged with the Selwyn District Council prior to any construction activity and adhered to, for the management of domestic waste from site staff, construction waste and hazardous waste.

10.2.2 At each construction area, provision shall be made for the recycling of paper, plastic, glass, aluminum, cans, waste oil and solvents. Containers and appropriate storage arrangements shall be provided for all other classes of waste.

10.2.3 All other construction waste shall be transported in enclosed containers to a Selwyn District or Christchurch City transfer station.

10.3 Hazardous Substance

All fuel, oil and hazardous substances shall be stored in accordance with a Hazardous Substances Management Plan to be prepared and submitted to the Selwyn District Council prior to this consent being given effect to.

The Hazardous Substances Management Plan shall address the following matters:

- a. Hazardous chemical storage
- b. Fuel and chemical spill control
- c. Spill containment
- d. Spill clean up
- e. Incident reporting

That plan shall be kept on site and provided to the Selwyn District Council upon request.

Fuel, oil and hazardous substance storage areas shall be bunded with capacity to contain 120% of the volume of stored material in the event of a spill.

11. Cultural Impacts

11.1 Accidental Discovery Protocol

11.1.1 An accidental discovery protocol shall be prepared prior to any construction commencing and copies lodged with the Te Rūnanga o Ngāi Tahu and the Selwyn District Council. This protocol shall cover both prehistoric (Maori) and historic sites, and shall be prepared in consultation with the New Zealand Historic Places Trust (NZHPT), Te Rūnanga o Ngāi Tahu and Ngāi Tuahuriri.

11.1.2 The protocol shall require assessment by a qualified archaeologist of any potential archaeological site discovered. If such a site is determined to be an archaeological site as defined by the Historic Places Act 1993, then NZHPT and Ngāi Tahu shall be contacted and appropriate responses received before construction work recommences. Then the site shall be recorded, trial excavations carried out followed by more thorough excavation if this is considered necessary by a suitably qualified archaeologist.

11.1.3 Where appropriate, all contractors, project managers and stakeholders shall be inducted into the protocol and made aware of their individual responsibilities under the protocol.

11.1.4 Before commencing any vegetation clearance or earthworks in any area listed in the Proposed Selwyn District Plan as a Wāhi Taonga site, Wāhi Taonga Management Area or Mahinga Kai site, the consent holder shall contact local rūnanga for advice as to the most appropriate methods for avoiding, remedying or mitigating adverse effects of the proposed activity.

12. Heritage

12.1 Historic Places Act Consents

12.1.1 Prior to commencing any construction, the consent holder shall obtain the appropriate consents to destroy, damage or modify any archaeological site, historic site or historic building classified under the Historic Places Act 1993, from the NZ Historic Places Trust for the work required to complete that stage of the project (section 18 Authority).

12.1.2 The section 18 investigations shall be accompanied by a scheme wide survey of areas affected by the scheme works to assess the distribution of unrecorded sites across the landscape. An appraisal of the scheme's effects on archaeological sites shall be undertaken.

12.1.3 Where practicable, all sites should be avoided, but where such sites cannot be avoided, full and appropriate recording and documentation of such sites should be undertaken before they are destroyed. Any mitigation of damage, modification or destruction of the sites shall be undertaken according to sections 10 and 12 of the Historic Places Act 1993.

12.2 Archeological and Heritage Plan

12.2.1 Prior to commencing any construction the consent holder shall prepare an Archeological and Heritage Plan which shall be lodged with the Selwyn District Council and the NZ Historic Places Trust. This plan shall be complied with and shall cover any destruction, damage or modification to any archaeological site, or historic site or building classified under the NZ Historic Places Act 1993 and identify any conditions to be complied with in relation to heritage. The Archeological and Heritage Plan shall include:

- a. Responsibilities of contractors and project managers
- b. Control of vegetation, stock and soil erosion
- c. Public access and vandalism
- d. Methods of excavation
- e. Sampling and analysis of archeological materials

Any taonga tuturu (artefacts of tangata whenua origin) that are recovered during the works are the property of the Crown and should be registered with the Ministry for Culture and Heritage. Such artefacts shall be stored in an appropriate repository either in a local or regional museum.

13. Utilities

13.1 Power Utilities

13.1.1 Where any part of a building or structure needs to be constructed/located within the restricted areas specified under Table 2 of the NZECP 34:2001, prior to construction, the consent holder must submit to the Selwyn District Council or Canterbury Regional Council (and a copy to Transpower) a certificate from a suitably qualified electrical engineer confirming that any building or structure complies with the minimum safe distances from the Benmore – Haywards A Benmore – Islington A, Roxburgh – Islington A, Brackendale – Hororata A, and Hororata – Islington E lines as specified in Table 3 of the NZECP 34:2001.

Please note that the distances specified include an allowance for climatic conditions (i.e., conductor swing).

13.1.2 No buildings or structures (including temporary buildings) shall be located within 12 metres of the outer edge of the visible foundations of any transmission line tower.

13.1.3 No fences of conductive materials shall be located within 5 metres of the outer edge of the visible foundations of any transmission line tower.

13.1.4 All buildings and other structures constructed on site shall be located so as not to preclude existing 4-wheel drive access to any transmission line support structure.

13.1.5 All machinery and mobile plant operated on site must maintain a minimum clearance distance of 4 metres from all transmission line conductors at all times.

13.1.6 No person shall, in the case of any tower supporting any conductor, excavate or otherwise interfere with any land:

- a. at a depth greater than 300mm within 6 metres of the outer edge of the visible foundations of the tower; or
- b. at a depth greater than 3 metres, between 6 metres and 12 metres of the outer edge of the visible foundation of the tower; or
- c. in such a way as to create an unstable batter.
- d. When, in exceptional circumstances, the consent holder wishes to undertake works within the specified distances, Transpower shall be consulted with in order to provide the requisite approvals for encroachment, in accordance with the NZECP 34:2001.

13.1.7 Excavated or other material must not be deposited under or near the Benmore – Islington A, Roxburgh – Islington A, Brackendale – Hororata A, and Hororata – Islington E transmission lines so as to reduce the vertical distance from the ground to the conductors to a distance less than:

- a. 6.5 metres vertically, across or along driveways or on any other land traversable by vehicles;
- b. 5.5 metres vertically, on any land not traversable by vehicles due to inaccessibility; and
- c. 3 metres in any distance other than vertical on all land.

13.1.8 Excavated or other material must not be deposited under or near the Benmore – Haywards A transmission line so as to reduce the vertical distance from the ground to the conductors to a distance less than:

- a. 8 metres vertically, across or along driveways or any other land traversable by vehicles;
- b. 6.5 metres vertically, on any land not traversable by vehicles due to inaccessibility;
- c. 3 metres in any distance other than vertical on all land.

Please note that the distances specified include an allowance for mechanical creep (i.e. permanent elongation of the conductors).

13.1.9 The consent holder must ensure that the discharge of dust created by earthworks, transportation and construction activities does not create any dust hazard or nuisance to any high voltage transmission lines.

13.1.10 Prior to the commencement of any construction, the consent holder must submit an “Dust Management Plan” for the activity to the Consents Manager, Selwyn District Council (and a copy to Transpower). In particular, the Dust Management Plan shall specify the potential dust sources and the mitigation measures to be undertaken to minimize dust in order to protect the existing high voltage transmission lines and locations where ground levels may change in and around transmission lines.

13.1.11 All land use activities, including earthworks located on site must comply with the New Zealand Code of Practice for Electrical Safe Distances NZECP 34:2001 or any subsequent amendment to this code.

13.1.12 All trees and vegetation planted on site must comply with the Electricity (Hazards from Trees) Regulations 2003 or any subsequent amendment to these regulations.

13.1.13 Existing access arrangements to transmission line support structures shall be retained where practicable. Where the consent holder requires or causes a change in access arrangements, then alternative arrangements shall be made (to the satisfaction of Transpower) to provide safe 4-wheel drive, 24hr access to support structure bases (including during the construction period).

14. Bonding

14.1 Environmental Bond

14.1.1 The consent holder shall provide a bond in favour of the Selwyn District Council to secure performance of this consent as outlined in Schedule 3 attached.

Proposed Conditions for Selwyn District Council Designations

1. General

1.1 Designation

1.1.1 Pursuant to section 184 of the Resource Management Act, 1991, the term of the designation is extended and shall not lapse for a period of ten years from the date it is included in the District Plan.

1.1.2 Except where modified by specific conditions set out below, the scheme and all incidental work shall be constructed, operated and maintained generally in accordance with the details contained in following documents,:

- Central Plains Water Enhancement Scheme;
- Notice of Requirement for a Designation – Annexure A;
- Notice of Requirement for a Designation – Annexure C;
- Notice of Requirement for a Designation – Annexure D;
- Assessment of Effects on the Environment, Chapter 4, Project Description

1.2 Outline Plan

1.2.1 Pursuant to S.176A of the Resource Management Act 1991, an Outline Plan shall be submitted by the Requiring Authority to the Selwyn District Council before any construction is commenced.

1.3 Hours of Work

1.3.1 The hours of construction work shall be unrestricted except as set out below:

- (a) Work on the intake structures, inlet canals, tunnels, reservoir, Waianiwiwa Dam and main headrace shall be limited to 0630-2000, Monday to Saturday inclusive and excluding any public holiday, within 200 m of any residential dwelling, except where agreed to by the applicable property owners.
- (b) Notwithstanding the above restriction, concrete pouring and associated activities can occur at any time.

1.4 Annual Environmental Report

1.4.1 An Annual Environmental Report is to be submitted on each anniversary of the date of commencement of the scheme, until commissioning is complete. The matters to be covered shall include:

- (a) A description of the works (including construction, mitigation, rehabilitation, monitoring and reporting) carried out in the preceding 12 months.

- (b) An explanation of any departure in the preceding 12 months from the previous Annual Environmental Report.
- (c) A description of all construction, mitigation, rehabilitation, monitoring and reporting intended to be carried out in the next 12 months with an approximate timetable of activities.
- (d) A description and analysis of any unexpected adverse effect on the environment that has arisen as a result of the works in the last 12 months, the steps taken in response to that effect, and the results of those steps.
- (e) A record of complaints received in the last 12 months and the mitigation measures adopted.

1.5 Construction programme

1.5.1 A construction programme, including timetable, sequence of events and duration, shall be submitted to the Selwyn District Council at least one month prior to the commencement of works.

1.6 Other Approvals

1.6.1 Details of all necessary permissions required and or obtained under other legislation (eg Historic Places Act, Reserves Act) shall be supplied to the Selwyn District Council at least one month prior to the commencement of works.

1.7 Amended Management Plans

1.7.1 The Requiring Authority may, at any time, submit to the Selwyn District Council an amendment to any of the Management Plans referred to and required by the conditions below for the purpose of better avoiding, remedying or mitigating adverse effects which may arise as a result of undertaking the works.

1.8 As Built Plans

1.8.1 Within two months of the completion of the construction works for any of the major components of the Central Plains Water Enhancement Scheme, The Requiring Authority shall supply the Selwyn District Council with a complete set of "as built" plans confirming the location of the works.

1.9 Complaints register

1.9.1 The Requiring Authority shall maintain and keep a complaints register for all aspects of all operations in relation to construction activities. The register shall include the complaints registers required for the specific management plans specified in the conditions below as well as any other complaints received and shall detail the date, time and type of complaint, cause of the complaint, and action taken by the Requiring Authority in response to the complaint. The register shall be available to the Selwyn District Council at all reasonable times.

2. Traffic Management

2.1 Road/ Rail crossings

2.1.1 The Midland rail line (Rolleston – Greymouth) shall remain open at all times.

2.1.2 The design of any road/rail/headrace crossing shall meet the relevant sight distances specified in Appendix 10 of the Rural Section of the proposed Selwyn District Plan. Transit New Zealand's Standards and Guideline Manual (SP/M/021), Planning and Policy Manual (SP/M001) and State Highway Geometric Design Manual (SP/M024) for safe stopping distances, safe passing distances, intersection entry sight distances and clear zone distances to hazards.

2.2 Construction Traffic

2.2.1 Prior to construction, a Traffic Management Plan shall be prepared and a copy given to the Selwyn District Council and Transit New Zealand. This management plan shall be complied with at all times and it shall include the following provisions:

- (a) On all public roads, signs shall be erected warning motorists of a haul road intersection giving rise to a hazard due to heavy trucks crossing.
- (b) Warning signs shall be erected at intersections of all haul roads and public roads prohibiting public access to the construction zone.
- (c) Stock crossing methods shall be established after consulting with local farmers.
- (d) Local emergency services shall be notified of all temporary local road closures.
- (e) All construction vehicles shall be fitted with, and use flashing lights while operating in the construction zone and on haul roads.
- (f) All construction vehicles shall comply with the Land Transport Safety Authority rule for vehicle dimensions and mass on public roads, unless specific over dimension permits are obtained.
- (g) Movement of oversize vehicles and equipment on SH 1, SH73 and SH 77 shall comply with Transit New Zealand requirements.
- (h) Road signs shall be erected on roads where necessary to warn motorists of the hazard caused by fog or frost. The design and location of such signs shall be approved by Transit New Zealand for SH1, SH73 and SH77, or the Selwyn District Council for all other roads.
- (i) Road safety audits shall be carried out every six months of traffic signals/stop signs controlling the intersections of all public roads with haul roads. The results of those

audits shall be reviewed and steps taken to ensure motorists do not suffer unreasonable delays. Regular monitoring of traffic signals to ensure any faults are identified and repaired.

- (j) Measures for suppression to mitigate the effects of dust.
- (k) Measures to maintain vehicles and machinery to mitigate the effects of fumes.

2.3 Haul Roads – Intersection with State Highways 73 and 77

2.3.1 Where any haul road intersects with a State Highway, the construction and operation of the intersections shall comply with the following:

- (a) Prior to construction, a Traffic Management Plan dealing with State Highway intersections with haul roads shall be prepared which complies with the Transit New Zealand Code of Practice for Temporary Traffic Management. A copy of this plan shall be provided to Transit New Zealand prior to construction commencing.
- (b) Where any haul road intersects any State Highway, the haul road shall be constructed to a maximum width of 15m, with a speed limit imposed on Haul Road traffic of 30 km/hr.
- (c) Where any haul road intersects any State Highway, sight distances both ways shall comply with the requirements of Tables 5A and 5B set out in Appendix 10 of the Proposed Selwyn District Plan (Rural Section).
- (d) Dust suppressant shall be applied to any haul road when required within 100 metres of an intersection with State Highway to ensure dust does not reduce the visibility for drivers approaching the intersection.

2.4 Haul Roads – Intersection with Selwyn District Council Roads

2.4.1 Where any haul road intersects with any formed legal roads other than a State Highway, the construction and operation of the intersection shall comply with the following:

- (e) Prior to construction, a Traffic Management Plan shall be prepared which complies with the Transit New Zealand Code of Practice for Temporary Traffic Management. A copy of this plan shall be provided to the Selwyn District Council prior to construction commencing.
- (f) Stop signs shall be erected and maintained to control intersections between all formed public roads any haul road.

- (g) Where any haul road intersects with any formed public road, the haul road shall be constructed to a maximum width of 15m, with a speed limit imposed on haul road traffic of 30 km/hr.
- (h) Where any project haul road intersects any formed public road, sight distances both ways shall comply with the requirements of Tables 5A and 5B set out in Appendix 10 of the Proposed Selwyn District Plan (Rural Section).
- (i) Dust suppressant shall be applied to any haul roads when required within 100 metres of an intersection with any formed public road to ensure dust does not reduce the visibility of drivers approaching the intersection.

2.5 Relocation of Roads in Waianiwaniwa Valley

2.5.1 Before the construction of the Waianiwaniwa Reservoir necessitates the physical stopping of any existing formed public roads, the Requiring Authority shall ensure alternative access roads are in place.

3. River Access

3.1 Maintenance of River Access

3.1.1 Where existing public access to a river is restricted as a result of construction works subject to this application, the Requiring Authority or its contractors shall provide alternative access to an equivalent standard in a location as near as practicable to the existing access point.

4. Public Safety/Health and Safety

4.1 Health and Safety Management Plan

4.1.1 Prior to any construction the Requiring Authority shall develop and implement a Health and Safety Management Plan for both construction and operation of the Central Plains Enhancement Scheme which shall be provided to the Selwyn District Council, and shall be complied with on an ongoing basis. The Plan shall include at least the following:

4.1.2 Construction

- (a) Ensuring contractors comply with relevant construction regulations and codes of practice.
- (b) Ensuring contractors assess hazards on site and develop appropriate control plans that incorporate public health and safety requirements and incorporate public risk mitigation prior to engagement/ commencement of construction. This includes the provision of fencing and warning signs where appropriate to keep the public safe

from harm, and to prevent unauthorised access of people and stock into areas where hazards exist including, borrow areas, fill areas and haul roads.

- (c) Public and stakeholder consultation, education and information sharing.
- (d) Contractor and sub-contractor management.
- (e) Public notification of area of any blasting activities.
- (f) Induction/training requirements.
- (g) Emergency protocols/requirements, including arrangements for 24 hour emergency vehicle access (eg Civil Defence, Ambulance, Fire Service and Police).
- (h) Incident reporting procedures.
- (i) Appropriate hazard warnings (eg signs, sirens).
- (j) Restricting river use within 500m either direction of blasting.

4.1.3 Operation

- (k) Procedures to review and update the Plan as required.
- (l) How to deal with emergency events such as oil spills, earthquakes, fires and floods.

4.1.4 As part of implementing the Health and Safety Management Plan, the Requiring Authority shall:

- (a) Prepare and implement a monitoring plan for the structural safety of intake structures, inlet canals, tunnels, reservoir, Waianiwaniwa Dam and main headrace
- (b) Identify contingency events/document associated emergency response plans.
- (c) Make the plan available to relevant parties (eg councils, employees, civil defence, residents, etc).

4.2 Access During Construction

4.2.1 During construction, public access will be restricted to all construction, cut, fill and borrow areas by the use of suitable fences/barriers, with warning signs erected and maintained at appropriate locations.

5. Landscape and Rehabilitation

5.1 Landscape and Rehabilitation Management Plan

5.1.1 The Requiring Authority shall prepare a Landscape and Rehabilitation Management Plan which shall be lodged with the Selwyn District Council when the Outline Plan is submitted. Land restoration following construction must adhere to the Landscape and Rehabilitation Management Plan which shall apply to all areas within the designation except to the extent they are inconsistent with the conditions of any land use consents obtained from the Canterbury Regional Council.

5.1.2 The Landscape and Rehabilitation Management Plan shall cover the following areas and/or projects:

- (a) borrow areas within the designated land that will not ultimately be inundated by the Waianiwaniwa Reservoir or covered by the main headrace;
- (b) fill areas;
- (c) canal embankments;
- (d) the face of the Waianiwaniwa Dam;
- (e) sediment traps;
- (f) construction storage areas;
- (g) the construction zone generally where land has been disturbed.

5.1.3 The Landscape and Rehabilitation Plan shall contain:

- (a) Specifications for the use of recessive colours for all structures (all colours shall have a reflectivity of less than 40%)
- (b) final contours and finished heights of earthworks;
- (c) methods for stripping, storing and re-use of topsoil;
- (d) proposed planting – species, location and timing;
- (e) 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 on a plan;
- (f) the staging of vegetation removal;
- (g) rehabilitation of haul roads;

(h) methods and protocols for educating and training contracting personnel about the requirements of the Landscape and Rehabilitation Management Plan.

5.1.4 All canal embankments shall be re-grassed.

5.1.5 The face of the dam for the Waianiwaniwa Reservoir shall be regrassed.

5.1.6 Within two months of completion of any component of the construction works, the Requiring Authority shall issue a notice to the Selwyn District Council certifying that all construction debris or other materials from the construction works, that may pose a hazard to public safety or recreational activities have been removed.

6. Noise and Vibration

6.1 Construction Noise Limits

6.1.1 All construction activity shall be conducted so that noise emissions do not exceed the noise limits in the following table. Sound levels shall be measured and assessed in accordance with the provisions of NZS 6803:1999 "Acoustics – Construction Noise". These limits shall apply at all occupied residential units and schools. The Requiring Authority shall liaise with all schools and avoid construction noise during any particularly sensitive times.

Time of week	Time period	Duration of work					
		Typical duration (dBA)		Short-term duration (dBA)		Long-term duration (dBA)	
		L _{eq}	L _{max}	L _{eq}	L _{max}	L _{eq}	L _{max}
Weekdays	0630-0730	60	75	65	75	55	75
	0730-1800	75	90	80	95	70	85
	1800-2000	70	85	75	90	65	80
	2000-0630	45	75	45	75	45	75
Saturdays	0630-0730	45	75	45	75	45	75
	0730-1800	75	90	80	95	70	85
	1800-2000	45	75	45	75	45	75
	2000-0630	45	75	45	75	45	75
Sundays and public holidays	0630-0730	45	75	45	75	45	75
	0730-1800	55	85	55	85	55	85
	1800-2000	45	75	45	75	45	75
	2000-0630	45	75	45	75	45	75

6.2 Noise and Vibration Management Plan

6.2.1 Prior to the commencement of any construction activity, the Requiring Authority shall appoint an appropriately qualified acoustic engineer to prepare a Noise and Vibration Management Plan. That plan shall be lodged with the Selwyn District Council and adhered to during construction

6.2.2 The Noise and Vibration Management Plan shall include;

- (g) all applicable noise limits;
- (h) procedures for identifying dwellings within 150 metres of the headrace, 250 metres of bridges/siphons/piling, 75 metres of the distribution network, and 500 metres of any blasting;
- (i) mitigation options that will be adopted as required to comply with the noise limits;
- (j) procedures to be followed for monitoring of noise during construction works;
- (k) procedures for conducting pre and post construction structural checks for building within the vibration buffer distances,
- (l) liaison and complaint procedures. The complaint procedure shall require investigation of complaints within twenty-four hours, and immediate cessation of any construction activity found to be breaching the noise limits.

6.2.3 During dam construction works the Requiring Authority shall install and maintain a noise monitoring station between the dam and Coalgate Township. The station shall be configured to record the LAeq(1 hour) and LAFmax values for every hour throughout the entire dam construction period. Results from the noise monitoring station shall be provided monthly to Selwyn District Council and residents of Coalgate. The location of the noise monitoring station shall be approved by Selwyn District Council prior to installation.

6.3 Operational Noise Limits

6.3.1 All operational noise from the scheme shall comply with the following noise limits when measured in accordance with NZS 6801:1991 "Measurement of Sound" and assessed in accordance with NZS 6802:1991 "Assessment of Environmental Sound":

6.3.2 Within the notional boundary of any dwelling, rest home, hospital, or classroom in any educational facility, except where that dwelling, rest home, hospital or classroom is located within a Living Zone:

- 0730 to 2000 hrs 60 dBA L₁₀
- 2000 to 0730 hrs 45 dBA L₁₀, 70 dBA L_{max}

Within any site boundary in a Living Zone:

- 0730 to 2000 hrs 55 dBA L₁₀
- 2000 to 0730 hrs 40 dBA L₁₀, 70 dBA L_{max}

7. Farms

7.1 Access to canals and races

7.1.1 The Requiring Authority shall erect and maintain stock fences between the Central Plains Enhancement Scheme and adjacent farms to prevent cattle accessing the main headrace canal, or any inlet canal.

7.2 Restoration Work

7.2.1 Where the works constructed under the designation affects land or chattels, the Requiring Authority shall reconfigure, relocate, or restore all existing:

- (a) fences;
- (b) irrigation facilities;
- (c) farm lanes/tracks;
- (d) buildings; and
- (e) landscaping;

7.2.2 This includes providing bridges and/or alternative structures where necessary to maintain viable lanes/tracks or irrigation facilities.

8. Significant Indigenous Vegetation

8.1.1 Prior to any construction occurring, the Requiring Authority shall, in consultation with Selwyn District Council, produce a Significant Indigenous Vegetation Protection Plan and adhere to this on an ongoing basis. This plan shall:

- (c) identify and map any significant indigenous vegetation that has the potential to be destroyed or adversely affected by construction activities
- (d) determine appropriate methods of protecting the plants from damage, or if that is not possible, mitigating the effects of the loss of plants by methods such as transplanting, or re-seeding nearby areas.

9. Dust

9.1 Control of Dust

9.1.1 All practicable measures shall be made to limit the extent, duration and frequency of dust discharges from construction, operation and maintenance activities.

9.2 Dust Management Plan

9.2.1 Prior to any construction, the Requiring Authority shall prepare a Dust Management Plan which shall be provided to the Selwyn District Council, and adhered to during construction. This plan shall cover:

- (a) methods of dust suppression to minimise the effects of dust beyond the boundary of the construction site, including, but not limited to, use of sprinklers and water carts, and revegetation of stockpiles where appropriate;
- (b) dust monitoring;
- (c) nomination of an employee/contractor to be responsible for consulting with local residents about dust during construction;
- (d) identification of areas within 100m of any construction site 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;
- (e) regular public road maintenance to ensure optimal surface conditions;
- (f) for concrete batching plants, specific methods to mitigate the effects of dust.
- (g) proposed methods of providing a cleaning service to residents and businesses affected by dust from construction activities.

9.3 Complaints

9.3.1 During construction, the Requiring Authority shall maintain a complaints register dealing with dust. The register shall detail the time and type of complaint, cause of the complaint and action taken by the Requiring Authority in response to the complaint. The register shall be available to the Selwyn District Council at all reasonable times.

10. Waste Management and Hazardous Substances

10.1 Remediation Action Plan

10.1.1 A Remediation Action Plan for contaminated areas will be prepared, lodged with the Selwyn District Council prior to any construction activity and adhered to where the construction of any works subject to the designation requires the disturbance on removal of any

- (a) landfill;
- (b) farm dump;
- (c) offal pit;
- (d) septic tank;
- (e) silage pits;
- (f) dairy effluent disposal ponds; and
- (g) coal mine or coal mine workings.

10.1.2 The Remediation Action Plan above shall address the matters set out in (a) - (f) below, with a level of detail appropriate to the degree of risk presented by the disturbance, removal or inundation of each specific contaminated area:

- (a) The earthworks and transport controls to minimise the off-site mitigation of contamination (via air or water during the remedial works).
- (b) Appropriate measures for the control of dust or odour;
- (c) The diversion of stormwater away from the remedial works;
- (d) The treatment of contaminated stormwater or groundwater in the remediation area;
- (e) Sampling and reporting;
- (f) The health and safety requirements for remediation workers.

10.2 Solid Waste

10.2.1 A Waste Management Plan shall be prepared and lodged with the Selwyn District Council prior to any construction activity and adhered to, for the management of domestic waste from site staff, construction waste and hazardous waste.

10.2.2 At each construction area, provision shall be made for the recycling of paper, plastic, glass, aluminium, cans, waste oil and solvents. Containers and appropriate storage arrangements shall be provided for all other classes of waste.

10.2.3 Cleanfill construction waste shall be disposed of within the area of the designation.

10.2.4 All other construction waste shall be transported in enclosed containers to a Selwyn District or Christchurch City transfer station.

10.3 Hazardous Substances

10.3.1 All fuel, oil and hazardous substances shall be stored in accordance with a Hazardous Substances Management Plan to be prepared and submitted to the Selwyn District Council prior to this designation being given effect to.

10.3.2 The Hazardous Substances Management Plan shall address the following matters:

- (a) Hazardous chemical storage
- (b) Fuel and chemical spill control
- (c) Spill containment
- (d) Spill clean up
- (e) Incident reporting

That plan shall be kept on site and provided to the Selwyn District Council upon request.

10.3.3 Fuel, oil and hazardous substance storage areas shall be bunded with capacity to contain 120% of the volume of stored material in the event of a spill.

11. Cultural Impacts

11.1 Accidental Discovery Protocol

11.1.1 An accidental discovery protocol shall be prepared prior to any construction commencing and copies lodged with the Te Rūnanga o Ngāi Tahu and the Selwyn District Council. This protocol shall cover both prehistoric (Maori) and historic sites, and shall be prepared in consultation with the New Zealand Historic Places Trust (NZHPT) Te Rūnanga o Ngāi Tahu and Ngāi Tuahuriri.

11.1.2 The protocol shall require assessment by a qualified archaeologist of any potential archaeological site discovered. If such a site is determined to be an archaeological site as defined by the Historic Places Act 1993, then NZHPT and Ngāi Tahu shall be contacted and appropriate responses received before construction work recommences. Then the site shall be recorded, trial excavations carried out followed by more thorough excavation if this is considered necessary by a suitably qualified archaeologist.

11.1.3 Where appropriate, all contractors, project managers and stakeholders shall be inducted into the protocol and made aware of their individual responsibilities under the protocol.

11.1.4 Before commencing any vegetation clearance or earthworks in any area listed in the Proposed Selwyn District Plan as a Wāhi Taonga site, Wāhi Taonga Management Area or Mahinga Kai site, the Requiring Authority shall contact local rūnanga for advice as to the most appropriate methods for avoiding, remedying or mitigating adverse effects of the proposed activity.

12. Heritage

12.1 Historic Places Act Consents

12.1.1 Prior to commencing any construction, the consent holder shall obtain the appropriate consents to destroy, damage or modify any archaeological site, historic site or historic building classified under the Historic Places Act 1993, from the NZ Historic Places Trust for the work required to complete that stage of the project (section 18 Authority).

12.1.2 The section 18 investigations shall be accompanied by a scheme wide survey of areas affected by the scheme works to assess the distribution of unrecorded sites across the landscape. An appraisal of the scheme's effects on archaeological sites shall be undertaken.

12.1.3 Where practicable, all sites should be avoided, but where such sites cannot be avoided, full and appropriate recording and documentation of such sites should be undertaken before they are destroyed. Any mitigation of damage, modification or destruction of the sites shall be undertaken according to sections 10 and 12 of the Historic Places Act 1993.

12.2 Archeological and Heritage Plan

12.2.1 Prior to commencing any construction the consent holder shall prepare an Archeological and Heritage Plan which shall be lodged with the Selwyn District Council and the NZ Historic Places Trust. This plan shall be complied with and shall cover any destruction, damage or modification to any archaeological site, or historic site or building classified under the NZ Historic Places Act 1993 and identify any conditions to be complied with in relation to heritage. The Archeological and Heritage Plan shall include:

- (a) Responsibilities of contractors and project managers
- (b) Control of vegetation, stock and soil erosion
- (c) Public access and vandalism
- (d) Methods of excavation
- (e) Sampling and analysis of archeological materials

12.2.2 Any taonga tuturu (artefacts of tangata whenua origin) that are recovered during the works are the property of the Crown and should be registered with the Ministry for Culture and Heritage. Such artefacts shall be stored in an appropriate repository either in a local or regional museum.

13. Utilities

13.1 Power Utilities

13.1.1 Where any part of a building or structure needs to be constructed/located within the restricted areas specified under Table 2 of the NZECP 34:2001, prior to that

construction commencing, the Requiring Authority must submit to the Selwyn District Council (and a copy to Transpower) a certificate from a suitably qualified electrical engineer confirming that any building or structure complies with the minimum safe distances from the Benmore – Haywards A Benmore – Islington A, Roxburgh – Islington A, Brackendale – Hororata A, and Hororata – Islington E lines as specified in Table 3 of the NZECP 34:2001.

13.1.2 Please note that the distances specified include an allowance for climatic conditions (ie, conductor swing).

13.1.3 No buildings or structures (including temporary buildings) shall be located within 12 metres of the outer edge of the visible foundations of any transmission line tower.

13.1.4 No fences of conductive materials shall be located within 5 metres of the outer edge of the visible foundations of any transmission line tower.

13.1.5 All buildings and other structures constructed on site shall be located so as not to preclude existing 4-wheel drive access to any transmission line support structure.

13.1.6 All machinery and mobile plant operated on site must maintain a minimum clearance distance of 4 metres from all transmission line conductors at all times.

13.1.7 No person shall, in the case of any tower supporting any conductor, excavate or otherwise interfere with any land:

- (a) at a depth greater than 300mm within 6 metres of the outer edge of the visible foundations of the tower; or
- (b) at a depth greater than 3 metres, between 6 metres and 12 metres of the outer edge of the visible foundation of the tower; or
- (c) in such a way as to create an unstable batter.
- (d) When, in exceptional circumstances, the Requiring Authority wishes to undertake works within the specified distances, Transpower shall be consulted in order to provide the requisite approvals for encroachment, in accordance with the NZECP 34:2001.

13.1.8 Excavated or other material must not be deposited under or near the Benmore – Islington A, Roxburgh – Islington A, Brackendale – Hororata A, and Hororata – Islington E transmission lines so as to reduce the vertical distance from the ground to the conductors to a distance less than:

- (a) 6.5 metres vertically, across or along driveways or on any other land traversable by vehicles;
- (b) 5.5 metres vertically, on any land not traversable by vehicles due to inaccessibility; and

(c) 3 metres in any distance other than vertical on all land.

13.1.9 Excavated or other material must not be deposited under or near the Benmore – Haywards A transmission line so as to reduce the vertical distance from the ground to the conductors to a distance less than:

- (a) 8 metres vertically, across or along driveways or any other land traversable by vehicles;
- (b) 6.5 metres vertically, on any land not traversable by vehicles due to inaccessibility;
- (c) 3 metres in any distance other than vertical on all land.

Please note that the distances specified include an allowance for mechanic creep (ie permanent elongation of the conductors).

13.1.10 The Requiring Authority must ensure that the discharge of dust created by earthworks, transportation and construction activities does not create any dust hazard or nuisance to any high voltage transmission lines.

13.1.11 Prior to the commencement of any construction, the Requiring Authority must submit a “Dust Management Plan” for the activity to the Consents Manager, Selwyn District Council (and a copy to Transpower). In particular, the Dust Management Plan shall specify the potential dust sources and the mitigation measures to be undertaken to minimize dust in order to protect the existing high voltage transmission lines and locations where ground levels may change in and around transmission lines.

13.1.12 All land use activities, including earthworks located on site must comply with the New Zealand Code of Practice for Electrical Safe Distances NZECP 34:2001 or any subsequent amendment to this code.

13.1.13 All trees and vegetation planted on site must comply with the Electricity (Hazards from Trees) Regulations 2003 or any subsequent amendment to these regulations.

13.1.14 Existing access arrangements to transmission line support structures shall be retained where practicable. Where the Requiring Authority requires or causes a change in access arrangements, then alternative arrangements shall be made (to the satisfaction of Transpower) to provide safe 4-wheel drive, 24hr access to support structure bases (including during the construction period).

13.1.15 To ensure that there are no adverse effects or interruptions to supply, on the Benmore – Haywards A transmission line (namely Tower 593) as a result of the proposed reservoir, the Requiring Authority shall:

- (a) Consult with Transpower once the proposed reservoir’s finished water levels have been finalised (prior to creation of the reservoir), to determine the location of proposed water levels in relation to the transmission line and tower, determine the need for relocating that tower, and/or establish any alternative access arrangements;

- (b) In the case that tower relocation is deemed necessary, the Requiring Authority shall, subject only to reasonable planned interruption, seek to relocate Tower 593, to a same or similar standard (including property rights), and ensure 24-hour, 4-wheel drive access is provided and maintained, prior to flooding the area in the vicinity of that tower;
- (c) During the design and execution of the proposed works, the Requiring Authority shall liaise with Transpower to ensure that all safety, access and maintenance requirements in relation to Tower 593 are being met.

14. Bonding

14.1 Environmental Bond

14.1.1 The Requiring Authority shall enter into a bond in favour of the Selwyn District Council for its interest as outlined in Schedule 3 attached.

Schedule 3: Bonding

1.1 Bonding

The Consent Holder shall provide and maintain in favour of the Canterbury Regional Council and the Selwyn District Council (jointly for their respective interests) a bond to secure compliance by the Consent Holder with the conditions of the following resource consents and designations:

- (a) Resource Consent Numbered XX to XX, granted by Environment Canterbury;
- (b) Resource Consent Numbered XX to XX, granted by Selwyn District Council;
- (c) Designations Numbered XX to XX, granted by Selwyn District Council;

including the completion of all rehabilitation works required by these consents and designations and all monitoring obligations of the Consent Holder and all works to avoid, remedy, or mitigate any significant adverse effects on the environment arising as the result of the exercise of the consents or rights pursuant to the designations.

1.2 Form of Bond

The bond shall be in a form generally used by a bank or insurance company registered to conduct business in New Zealand and approved by, Environment Canterbury and the Selwyn District Council (“the Councils”), or, in the event of the Councils not agreeing, approved by an independent firm of solicitors nominated by the Councils jointly.

1.3 Content of Bond

The bond shall provide that the Consent Holder shall be liable and remain liable for meeting:

- (a) The cost of completing the works required to operate the Scheme in accordance with the consents; or alternatively
- (b) The cost of remedying or mitigating any breach of the conditions of the consents as detailed in condition 1.1 above; and
- (c) The cost of avoiding, remedying or mitigating and/or monitoring any significant adverse effect on the environment, and caused by the Scheme,

which became apparent during or after the expiry of the consents set out above.

1.4 Payment

The payment of the bond quantum by the Consent Holder shall be guaranteed by a guarantor acceptable to the Councils.

The guarantor shall bind itself to pay up to the bond quantum for the carrying out and completion of all obligations of the Consent Holder under the bond.

1.5 Term

The bond shall be executed before the commencement of any construction works on the Scheme and may be renewed from time to time in accordance with this condition and shall remain in place for a period of 10 years after the surrender, expiry or lapsing of the consents referred to in condition 1.1.

1.6 Amount

The amount of the bond shall be set initially by agreement between the Consent Holder and the Councils, taking into account the estimated cost of meeting the obligations for which the bond is given as set out in condition 1.3 above.

- (a) The amount of the bond will then be reviewed and reassessed by the Consent Holder and the Councils every 12 months from the date the initial bond amount was lodged until a date two years after the date on which all consents listed in condition 1.1 have been given effect to. After that, it will be reviewed and reassessed by the Consent Holder and the Councils at five yearly intervals for the duration of the consents to which this condition relates.
- (b) During the construction phase of the Scheme, a scope of works planned for the balance of the construction period will be provided by the Consent Holder to the Councils, both prior to setting the initial bond amount, and again at each annual reassessment, to assist in setting the bond amount as outlined in condition 1.6(a) above.
- (c) In the event of the Consent Holder and the Councils not reaching agreement on a bond amount within thirty working days (30) days of the date the review and reassessment falls due, it will be assessed by an independent bond assessor appointed by the Councils jointly, and the decision of that person shall be final and binding

- (d) If at any time the amount of the bond is varied pursuant to this condition then the Consent Holder and guarantor approved by the Councils, shall within thirty (30) working days of notification to the Consent Holder of the varied bond amount, execute and lodge with the Councils a new bond for the varied amount or the additional amount required in excess of the existing bond.
- (e) The Consent Holder will not exercise, or shall cease to exercise, these consents:
 - 1. Until the bond referred to in condition 1.5(a) above is executed by the Consent Holder and guarantor and deposited with the Councils; and
 - 2. In respect of any varied bond referred to in conditions 1.5 (b) and (d) above, after thirty (30) working days has expired from the date the Consent Holder was notified of the terms of the varied bond by either Council, unless the varied bond has been executed by the Consent Holder and guarantor, and has been deposited with the Councils, or the varied bond decreases the bond amount required to be provided by the Consent Holder.

1.7 Section 109

The provisions of Section 109 of the Act shall apply to any bond required pursuant to this condition.

1.8 Costs

The Consent Holder shall meet the costs of providing any bond, including the costs of preparation of the bond and any substitute bond, and the costs of any professional bond assessor engaged to resolve the appropriate quantum of the initial bond to be provided or any varied bond on review and reassessment.

New Zealand Dam Safety Guidelines 2000, New Zealand Society on Large Dams

APPENDIX E OPERATION, MAINTENANCE AND SURVEILLANCE

E.1 Introduction

This Appendix builds on the guidelines for operations, maintenance and surveillance contained in the main text, the focus remaining on matters related to dam safety. Operating and maintenance requirements from functional or asset management perspectives, which would also be included in a complete operating system, are not included. While the surveillance aspects of this Appendix have much in common with those outlined for Commissioning in Appendix D, this Appendix relates to ongoing operations once the dam has been commissioned.

The detail of this Appendix is mainly relevant for Medium and High Potential Impact category dams, but elements are also applicable to Low hazard category dams. Owners of Low Potential Impact dams and their Technical Advisers should assess the following recommendations and adapt appropriate parts for use on their dam. Large parts of these recommendations may be relevant where the asset represented by the dam is of high value and the commercial consequences of dam failure are significant.

It is worth noting that operations, maintenance and surveillance all contribute to the safe performance of the dam and its appurtenant structures.

E.2 Personnel and Training

Safe management of dams is a frame of mind and involves all the people concerned down from the Owner (or senior owner representative), through Managers to Operations Staff. Education and training must therefore be conceived along the lines of developing awareness of the need for ongoing vigilance, surveillance and maintenance in addition to giving instruction in the 'nuts and bolts' mechanics of the relevant and desirable procedures. The training and awareness raising must be related to the specific characteristics and Potential Impact category of the dam.

The Owner is responsible for operating the dam safely and also sets requirements from the viewpoint of protecting asset value. Generally, Owners will not be fully conversant with the technical requirements of operations, maintenance and surveillance to maintain safety. Thus they will rely on advice from the Designer in the case of a new dam or Technical Specialists in the case of existing dams which do not already have formalised procedures. It is important that the Owner ensures that the advice is given by appropriately qualified personnel, who will have received "training" through past experience.

Training will depend on the circumstances, ranging from the Designer training the Owner/Operator of a small Low Potential Impact dam, to Operators of major High Potential Impact dams being taken through structured training courses, seminars, audits and refresher courses. Techniques may embody:

- attendance at relevant seminars (including overseas, e.g. ANCOLD courses)
- membership of NZSOLD and attendance at their seminars
- development of 'in house' procedures and implementation of them in practice
- interaction with other dam owners and getting the benefit of their experience

- keeping up to date through acquisition of the latest guidelines and training materials. Training materials are available from NZSOLD.

Table E.1.
Proficiencies Required for Personnel Involved in Dam Safety Implementation.

GROUP	PRINCIPAL AREAS OF PROFICIENCY
Owner Manager Administrator	<ul style="list-style-type: none"> • Awareness of environmental and financial responsibilities relating to dam safety • Understanding significance of hazard and risk • Support of quality assurance principles
Technical Advisers	<ul style="list-style-type: none"> • Geotechnical principles • Design principles including structural, geotechnical, hydrologic and hydraulic • Construction techniques • Operation and maintenance procedures • Surveillance processes • Response to dam safety issues • Emergency planning • Emergency response
Operations and Maintenance Personnel *	<ul style="list-style-type: none"> • Safe operations procedures • Maintenance practices • Surveillance principles, particularly monitoring • Emergency planning • Need for vigilance
Technical Advisor, Dams Field Personnel *	<ul style="list-style-type: none"> • Awareness of visual signs of dam safety deficiencies • Procedures for operating mechanical items • Emergency response including alerting others • Surveillance principles, particularly monitoring • Need for vigilance
Key Emergency Personnel*/ Civil Defence	<ul style="list-style-type: none"> • Awareness of the potential impact • Emergency planning and response
Territorial Authorities/Regional Councils	<ul style="list-style-type: none"> • Awareness of planning, Resource and Building Consent implications
Public at Risk	<ul style="list-style-type: none"> • Emergency awareness and response • Awareness of the potential impact

E.3 Scope and Structure of Manual

The manual describing procedures for operations, maintenance and surveillance, is a vital document and is customarily referred to just as the “Operations (or Operating) and Maintenance” Manual or O & M Manual. The latter abbreviation will be adopted for the following discussion.

The scope of the O & M Manual will vary for each situation but a general scope can be outlined. Table E.2 which follows, sets out main contents which should be included in the manual from the dam safety perspective. Further detail on key aspects is contained in subsequent sections.

It is also important to note that the O & M Manual must be easy to understand and user-friendly for those who are to implement it on a routine basis, whether the medium is printed text, via computer software, or both. There is a risk otherwise that important aspects will be overlooked because of human reaction to complex instructions. It is recommended that basic instructions and

forms be as brief and simple as possible, with background information and detail in well referenced appendices.

Table E.2.
O & M Manual Contents from Dam Safety Perspective.

ASPECT	NOTES
INTRODUCTION	<ul style="list-style-type: none"> • Sets out scope and objectives
DAM STRUCTURE AND PURPOSE	<ul style="list-style-type: none"> • Describes what the dam is and does referring to other documents as appropriate (e.g. Design and safety Evaluation reports, consent conditions etc.)
APPURTENANT STRUCTURES	<ul style="list-style-type: none"> • Describes the function of appurtenant structures, such as spillway, intake, penstocks, powerhouse etc. references to other documents as appropriate (e.g. Design and safety Evaluation reports, consent conditions etc.)
KEY ASPECTS RELATING TO SAFETY	<ul style="list-style-type: none"> • Sets out the particular aspects of importance on this particular dam related to reservoir safety. This includes not only those aspects relating directly to the dam (such as structural, geological and dam safety parameters) but also features of the appurtenant structures (such as gates, valves, electrical controls and communication systems). Part I includes the Health and safety Act requirements.
MANAGEMENT STRUCTURE AND PERSONNEL	<ul style="list-style-type: none"> • Describes how the dam is run and its appurtenant structures is run and who is responsible for what.
OPERATIONS AND MAINTENANCE REQUIREMENTS	<ul style="list-style-type: none"> • Describes how the dam and its appurtenant structures is to be operated and what is to be maintained and to what standards to maintain functional safety
LEGISLATIVE REQUIREMENTS	<ul style="list-style-type: none"> • Describes the procedures to be followed to meet operational and safety legislative requirements. This covers water use consent conditions, (under RMA), warrant of fitness, including compliance schedule, (under Building Act) and health and safety (under Health & Safety in Employment Act) issues.
SURVEILLANCE AND EVALUATION	<ul style="list-style-type: none"> • Sets out surveillance items, frequency, reporting requirements, acceptable limits for values measured and how data is to be evaluated and reacted to (including unusual events)
PLANT AND EQUIPMENT	<ul style="list-style-type: none"> • Details the maintenance and testing procedures and frequencies and documentation to meet the requirements of the building warrant of fitness under the Building Act.
EMERGENCY ACTION PLAN	<ul style="list-style-type: none"> • Sets out the plan and procedures to follow in the event of an emergency • Can be a stand alone document

E.4 Maintenance and Surveillance - Scope and Frequency

E.4.1 Operation

Features and equipment for the passage of water through the dam and its appurtenant structures must carry out their normal functions without leading to the uncontrolled release of the reservoir water. Uncontrolled release of the reservoir is interpreted as an event during which there is no control over the quantity of water and its rate of discharge from the reservoir.

It should be noted that in general the failure of a turbine or a penstock for example will not result in the uncontrolled release of reservoir water as the quantity and the size of the opening and the capacity of the inlet control rate of discharge. The Building Code covers the design and performance of these features. Normal operating circumstances, which may result in the uncontrolled release of reservoir water, include where discharge is likely to cause erosion, which puts the safety of the dam and therefore the reservoir in jeopardy. In this case procedures should be in place to meet the general requirements of these guidelines.

E.4.2 Maintenance

Maintenance can be separated into four areas:

- mechanical equipment impacting on operational safety (gates, pipelines, valves)
- electrical equipment to operate the same mechanical equipment or which telemeters data used in safety management or forms part of the emergency communications systems.
- the dam and its appurtenant structures
- the reservoir and its margins

Mechanical and electrical equipment require appropriate maintenance and testing. The aim of the testing programme is to demonstrate the equipment is in good working order and is capable of normal and emergency operation. In addition it is necessary for operators to be familiar with the performance of this equipment, especially if it otherwise infrequently used and if modifications or repairs have been carried out. During testing any associated issues of environmental concerns, and legal consents will have to be addressed by appropriate planning and consent processes.

The standard of maintenance and frequency and type of test will be according to the equipment function in terms of dam safety and normal operations. The Owner will decide his maintenance and testing regime for equipment controlling normal operations using usual commercial criteria. A typical testing programme for gates and valves involved in dam safety of medium and high potential impact dams is provided in Table E.3.

Table E.3.
Guideline Gate/Valve Testing Schedules.

GATE/VALVE FUNCTION	UNBALANCED HEAD TEST	BALANCED TEST	BACK-UP POWER SUPPLY TEST
Passage of floods	Annually 15% minimum opening. Initiated by back-up power supply	Six yearly. Full range. Initiated by back-up power supply	Monthly. Battery & motor start-up checks. 150mm min. opening
Reservoir evacuation only	Six yearly. 15% min. opening. Initiated by back-up power supply	Six yearly. Full range (in dry). Initiated by back-up power supply	Monthly Battery & motor stat-up checks. Nil gate opening
Machine intake	Six yearly.	Annually	N/A
Bulkheads and stoplogs	Twelve Yearly	N/A	N/A

Back-up power supply tests also form part of the gate tests. They concentrate on confirming satisfactory field operation. Control room function tests should also be checked for satisfactory performance. These include the testing of local operation, remote operation, automatic operation, over velocity tripping of intake gates and automatic re-pumping to counter gate drift. Gate hoisting ropes should be visually inspected annually, for defects such as broken strands, corrosion, deformation and loss of lubricant. Specifically selected ropes, representative of each gate installation, shall receive a six yearly non-destructive test.

Communications equipment should be tested and maintained as part of the exercising of Emergency Action Plans.

Typical aspects addressed under routine maintenance and assurance of functionality, include:

- undertaking regular system checks
- operating equipment deliberately if it has not operated frequently in service
- lubricating moving parts and keeping oil levels topped up
- controlling or repairing corrosion
- repairing and replacing worn or damaged equipment
- operating ancillary equipment such as standby generators and ensuring batteries are charged and suitable fuel is always available

Maintenance of dam components and the reservoir, will generally be on an as-needs basis. Any specific issues will be included in the compliance schedule. Routine items which are commonly addressed as part of operational safety include:

- clearing dead timber from the reservoir margins and the dam face which might block spillways and dealing with weed islands if there is a likelihood of these impairing the spillway function
- repairing rip rap damage or surface erosion on the dam face
- keeping surface drains, and drainage systems generally, in good condition
- draining seeps and arresting or repairing significant reservoir slumps and slides
- ensuring that trees and like growth do not establish on the dam or designated abutment areas to prevent root penetration and obscuring of seepages and slumps
- repairing cracks and erosion damage in spillway concrete

E.5 Surveillance - Scope and Frequency

The following text refers to routine surveillance carried out by the Owner or the Owner's Operators, and excludes external inspections (refer E6). It is this routine inspection and surveillance and its evaluation which is of greatest importance, as it can detect potential problems early and enable them to be dealt with more safely and cost effectively, giving the dam owner the opportunity to remedy, alleviate, or mitigate the problem. External inspections and major safety reviews are usually too infrequent to enable early detection. Refer to E7 and Appendix G.

The total surveillance requirements have provision for:

- regular surveillance (ongoing)
- intermediate inspections (annual)
- five-yearly reviews, or following an unusual event

Apart from evaluating the data and responding to it, as discussed in the next section, it is important that the data be logged systematically and in a form which makes it easy to utilise and record permanently. If the recording is not systematic, trends may be disguised and data may be difficult to interpret reliably.

Graphical presentation is important. The perception of significant trends or changes may be obscured by a mass of records of benign conditions. Monitoring schedules should be reviewed periodically (at least at Safety Reviews) to reduce them to essentials.

There is a need for quality assurance procedures with acceptable standards for the maintenance of instrument accuracy and measurement accuracy in data interpretation.

Tables E.4 and E.5 provide a list of typical inspection and surveillance items and indicative measurement frequencies for Medium and High Potential Impact dams. Designers or Technical Advisers will set actual requirements to suit the particular dam, in accordance with the compliance requirements.

E.6 Data Evaluation and Reactions

Surveillance will not serve its purpose unless the data gathered is evaluated against some acceptable criteria, warning signs are recognised promptly, and appropriate action is taken. In specific cases some may be detailed in the Compliance Schedule. In general for high and medium impact potential dams and their appurtenant structures the data is to be reviewed monthly for the determination of trends and detection of anomalies. There must be an adequate system for evaluation and action. Should a dam safety issue arise the Owner is likely to be required to demonstrate that all possible steps were taken in the analysis and response to the collected surveillance data.

Apart from reacting appropriately to visual signs, either on a common-sense basis or as more specifically laid out in the O & M Manual, the Manual should set maximum values (usually incorporating a margin of safety) for key parameters measured (such as seepages, uplift pressures, and pore pressures). The Manual should require the observer to compare the value measured against the limits set, and then state how to react if the value is exceeded. In some cases, the Manual may require some immediate preventative action such as lowering the reservoir, but generally there will be a referral system to the Technical Advisors nominated in the Manual as having responsibility for evaluation and advice.

E.7 Unusual Events

Surveillance and evaluation of performance should also be carried out following unusual events which may lead to emergencies and special procedures as covered under Emergency Action Plans. In the normal course of operations, unusual events should be evaluated to determine whether there has been any damage requiring correction, special safety measures needing to be implemented, and to assess behaviour compared with design.

Unusual events customarily anticipated in surveillance schedules, include:

- large rainfalls or floods
- earthquakes
- landslides into the reservoir
- windstorms
- volcanic eruption

E.8 Intermediate Inspections

Dam safety inspections are required to verify throughout the operating life of the structure the structural integrity of the dam and appurtenant structures, assuring protection of human life and property. Inspection types and frequencies are developed to suit particular cases and may be varied according to conditions. In general these inspections are conducted annually and in the

case of medium and high impact structures, carried out by someone outside the owner's staff. For low impact structures the owner may conduct them. Each inspection must be reported. Verification that

Table E.4.
Guideline Surveillance Schedules. (A) Inspection Guidelines.

FEATURE	INSPECT FOR:												
	Alignment	Animal Burrows	Cracks	Debris	Deterioration	Erosion	Human Activity	Leakage	Muddy Water	Seepage	Settlement & Slides	Vegetation	Weathering
EMBANKMENT DAMS													
Upstream Slope	M	M	M			M	M				A	A	
Downstream Slope	M	M	M			M	M	W	W	M	A	A	
Abutments		M	M					W		M	A	A	
Crest	M	M				A					A	A	
Seepage Areas								W	W	M			
Internal Drainage					A			W	W				
Relief Drains	M			M		A		W	W				
CONCRETE DAMS													
Upstream Face			M		A						A		A
Downstream Face			M		A			W		M	A		A
Abutments			M		A			W		M	A	A	A
Crests	M		M		A						A		A
SPILLWAYS													
Approach Channel				W									
Stilling Basin							M						
Discharge Channel				W	A						A	A	
Control Features				W	A								
Erosion Protection							M				M		
Side Slopes			M			M		M			A	A	
INLETS, OUTLETS AND DRAINS													
Inlet & Outlets	M			W	A			M				A	
Stilling Basin	M		M	W	A								
Discharge Channel			M	W								A	
Trashracks				W								A	
Emergency Systems					A		M						
GENERAL AREAS													
Reservoir Surface								A					
Shoreline											A	A	

Mechanical Systems					A								
Electrical Systems					A								
Upstream Systems							A						
Downstream Floodplains							A						
Lists features to be inspected at a dam and the problems or deficiencies to be looked for													

W = Weekly, M = Monthly, A = Annually

the inspection has been carried out and the report produced is part of the building warrant of fitness. Unless specifically required by the regional Authority the report is kept by the Owner but must be produced upon request.

The inspection report describes observations and interpretations and gives recommendations. The focus of the report is on matters relating to dam safety and actions required to be taken by the Owner to assure legal requirements are met. The Owner may take the opportunity to include in the report matters relating to asset management and health and safety. To accommodate

Table E.5.
Guideline Surveillance Schedule. (B) Instrumentation and Monitoring Guidelines.

FEATURE	INSPECT FOR:										
	Visual Observation	Movements	Uplift & Pore Pressure	Water Levels & Flow	Seepage Flows	Water Quality	Temp Meas	Crack & Joint Meas	Seismic Meas	Stress-Strain Meas	
EMBANKMENT DAMS											
Upstream Slope	M	A	M	C					C		
Downstream Slope	M	A	M		W	A		A	C		
Left/Right Abutments	M	A	M		W	A			C		
Crest	M	A	M					A	C		
Internal Drainage System			M		W	A					
Relief Drains	M		M		W						
Reprap & Slope Protection	M										
Tailings dam drainage						C					
CONCRETE DAMS											
Upstream Face	M	A		C			M	A	C	A	
Downstream Face	M	A	M				M	A	C	A	
Left/Right Abutments	M	A	M		W				C	A	
Crests	M	A	M				M	A	C	A	
Internal Drainage System			M		W			A			
Relief Drains	M		M		W						
Galleries	M	A						A	C	A	
Sluiceways/Controls	M			C							

SPILLWAYS										
Approach Channel	M	A		C						
Inlet/Outlet Structure	M	A	M	D	W					
Stilling Basin	M			D				A	C	
Discharge conduit/Channel	M		M	D				A		
Control Features	M									
Erosion Protection	M									
Side Slopes	M	A	M							
OUTLETS & DRAINS										
Inlet & Outlets	M	A	M	W				A	C	
Stilling Basin	M									
Discharge Channel	M	A	M	W				A		
Trashrack/Debris Control	M									
Emergency Systems	M									
GENERAL AREAS										
Reservoir Surface	M					W				
Mech/Elect Systems	M			W						
Shoreline	A					A				
Upstream Watershed	A					A				
Downstream Floodplains	A				M	A				
Lists features to be observed at a dam and the suggested instruments or observation Techniques to be used.										

W = Weekly, M = Monthly, A = Annually

recommendations, which are not essential to safety, a procedure sometimes adopted is to categorise recommendations into:

- urgent
- necessary
- desirable
- optional

or similar.

Inspections should be systematically organised so that the status of all critical aspects of the dam can be accurately recorded and evaluated. Field inspection checklists should be assembled as a part of the operation, maintenance and surveillance procedures. Reference to previous inspection reports should be made during or prior to the inspection. Generally, the intermediate inspection reports should include:

- observations during the inspection
- what has occurred since the previous inspection e.g. incidents, action arising from previous recommendations
- a review of monitored data and other information
- an evaluation and interpretation of the structural performance of the dam and related structures/equipment including a comparison of the conditions with those of the previous inspection
- appropriate photographs
- recommendations and action list

Dam safety inspections for low potential Impact structures should include:

- observations during the inspection;
- what has occurred since the previous inspection, e.g. incidents, action arising from previous recommendation;
- appropriate photographs; and
- recommendations and action list.

APPENDIX F EMERGENCY ACTION PLAN

F.1 Requirement for an Emergency Action Plan (EAP)

An Emergency Action Plan (EAP) is integral with the Operations and Surveillance procedures, considers all the potential hazards, and puts in place actions to isolate, prevent, protect life, or, mitigate losses.

An Emergency Action Plan should also be prepared prior to the construction of Medium and High Potential Impact earth dams. The documentation should also be prepared for similar category concrete dams if there is a potential for abutment erosion as a result of overtopping during construction of a concrete dam. The documentation will assist in identifying how to handle flood volumes and peak discharges during construction.

Situations which could give rise to an emergency include:

- Volcanic eruption (lava flow, ash, etc.)
- Major earthquake
- Major flood
- Major landslide into the reservoir, or from abutments
- Inadequate spillway (or diversion in the case of a dam under construction)
- Spillway blockage or inoperable gates
- Dam structure progressively failing due to seepage forces or piping
- Accidental damage
- Sabotage

An EAP should exist for all High and Medium Potential Impact Dams.

The hazard and risks will vary depending on the status of the dam and the plan requirements will vary accordingly. Legislation requires emergency action plans for the following stages of the life of a dam:

- Construction above medium impact level
- Commissioning
- Operation
- Alteration or decommissioning

F.2 Development of an Emergency Action Plan

An EAP should describe the actions to be taken by the dam owner and operators (or contractors when a dam is under construction) and relevant agencies in an emergency. The EAP should assign responsibility for each action to an individual and/or backup. The dam owner is responsible for co-ordination of input to the EAP from other agencies and affected parties

The steps in developing an EAP are generally as follows:

- Identification of those situations or events that would require initiation of an emergency action. Identification of the performance or surveillance indicators which will lead to an emergency being initiated.
- F-2 Appendix F - Emergency Action Plan
- Specification of the actions to be taken, and by whom.
- Identification of all sources, agencies, and individuals who are able to supply information for input into the EAP.
- Identification of all jurisdictions, agencies, and individuals who will be involved in implementing the EAP.
- Identification of primary and auxiliary communications systems, both internal (between persons at the dam) and external between dam personnel and external agencies).
- Identification all persons and agencies involved in the notification process, and draft a notification flow chart. Include who should be notified, in what order, and what other actions are expected of downstream agencies.
- Assess if each territorial, Regional and Central Government agency involved and having its own general emergency plan requires amendments to their plan to include actions required as a result of a dam emergency.
- Develop a draft EAP.
- Discuss fully with all the parties included on the notification list, seeking review and comment.
- Make any revisions, obtain any necessary regulatory approval, and circulate the EAP to those who have responsibilities under the plan.

F.3 Contents of an Emergency Action Plan

The EAP should include the following procedures and information

- Purpose of the Emergency Action Plan
- Responsibilities
- Emergency identification and evaluation
- Preventative actions (where available)
- Notification procedure
- Notification flow chart
- Communication systems
- Access to site
- Response during periods of darkness
- Response during periods of adverse weather
- Sources of equipment
- Stockpiling supplies and material
- Emergency power sources
- Inundation maps
- Warning systems (if used)

Purpose of the Emergency Action Plan

The Plan is designed to limit damage to the dam and areas downstream, and prevent loss of life. It should take into account conceivable failure scenarios applicable to the dam, the potential downstream consequences, and what realistically may be achieved to safe guard lives at risk and generally minimise damage.

The outcomes are:

- The identification of emergency conditions which could endanger the integrity of the dam and which require immediate action.
- Prescription of procedures which should be followed by the dam owner and operating personnel to initiate emergency procedures at the dam.
- Provides timely warning to appropriate emergency management agencies for their implementation of protection measures for downstream communities.
-

Responsibilities

This section should specify the person(s) or organisation(s) responsible for the surveillance, maintenance and operation of the dam and the person(s) and or agencies responsible for implementing various stages of the EAP.

Emergency Identification and Evaluation

If detected early enough, potential emergencies can be evaluated and preventative or remedial actions taken. The EAP should contain clear procedures for taking action when a potential emergency is identified. Notification of emergency situations requires that a responsible contact person initiates the remedial action and decide if and when an emergency should be declared and the EAP executed. Clear guidance should be provided in the EAP on the conditions which require that an emergency be declared.

Once an emergency situation has been identified and evaluated, it should be classified as to its urgency so that the appropriate action can be taken.

Preventative Action

This section should detail preventative actions, taken both prior to and following the development of emergency situations, to prepare for any emergency. It should detail provisions for surveillance and detection of an emergency situation and should clearly indicate what can be implemented in a timely manner. An important factor in the effectiveness of the Emergency Action Plan is the prompt detection and evaluation of information obtained from instrumentation and/or physical inspection and surveillance procedures.

The time factor from the onset of an emergency to awareness of imminent damage and its effect on the workability of the EAP should be detailed. Timely implementation of the EPA is a crucial element in its effectiveness and appropriate effective warning systems are imperative for downstream emergency authorities to minimise loss of life and property damage.

The following factors should be outlined in this section of the EAP:

- Surveillance, Monitoring and Warning Systems
- Alert and alarm levels for surveillance and monitoring systems
- Adverse Time Response
- The nature of the material that may potentially be released in a failure
- Alternative Source of Power and Communication
- Emergency Supplies and Resources
- Co-ordinating Information (e.g. weather forecasts, stream flow)

- Actions to lower the reservoir or limit inflows and outflows
- Actions to remedy, alleviate or mitigate the potential impact
-

Notification Procedures

Notification procedures must be clear and easy to follow. The EAP should set out a list of all persons to be notified in the event that an emergency is declared, and their order of priority.

For each type of emergency situation, the EAP should clearly indicate who is to make a call, to whom it is to be made, and in what priority.

Early notification to the N.Z. Police allows them to prepare for a mobilisation of forces before the emergency is declared. They can then determine if they have sufficient resources, or will need to call in the Civil Defence

The number of persons to be notified by each responsible individual should be kept to a minimum, and briefing of the news-media should be pre-planned to the greatest possible extent.

Notification Flow Chart

A notification flow chart is a diagram showing the hierarchy of notification during an emergency. It is a pictorial representation of the notification procedure. The EAP should contain a notification flow chart clearly summarising the notification procedure for each of the emergency conditions considered. Included are: N.Z. Police, Civil Defence, Owner, Contractors, Technical advisers, Territorial Local Authorities and media. The flow chart should include individual names and position titles, office and home telephone numbers, with alternative contacts and means of communication.

Copies to be available to all individuals having responsibilities under the plan, and prominently posted at the dam, and local emergency operations centre.

Communications Systems

Full details of the internal and external communications systems as they apply to the EAP should be included.

Access to the Site

The description of access should focus on primary and secondary routes and means for reaching the site under various conditions (e.g. foot, boat, helicopter, bulldozer), and the expected response (travel) time.

Response during Periods of Darkness

The EAP should cover the response to potential or actual emergency conditions during periods of darkness including those caused by power failures.

Response during Periods of Adverse Weather

The EAP should address emergency response under adverse weather conditions including extremes of cold, snow, or storms.

Sources of Equipment

The location and availability of equipment and contractors that could be mobilised in case of an emergency should be included.

Stockpiling Supplies and Materials

The location and availability of stockpiled materials and equipment for emergency use should be addressed.

Emergency Power Sources

Details on the location and operation of emergency power sources should be included.

Inundation Maps

Inundation maps are needed for District Planning, Resource Consent Management, N.Z. Police, Civil Defence and Territorial Local Authorities to develop management and evacuation plans. Flood hazard maps may already exist for the affected flood plains. Where the EAP scenario gives a flood peak < 2% probability event (1 in 50 year return period), then the existing flood hazard maps may suffice. They should be prepared wherever communities or significant numbers of dwellings are located in the flood plain. These maps will outline the area inundated in sufficient detail to locate dwellings, services and other significant features. Indication of flood wave travel times will be noted on the maps.

Warning Systems

Warning systems are sometimes used to provide warnings to residents, camp grounds, and parks that are close to the dam. Full details should be contained in the E A P and cover N.Z. Police, Civil Defence, Territorial Local Authority, Own Company, Contractor, and media.

Appendices

Additional items may be covered in the appendices to the EAP:

- General site plans may be useful
- Drawings showing the potential breach location used in the inundation study
- Tables showing the variation in flood stage with time at key locations in the flooded area
- Recording of Emergency situations
- EAP training and Review

F.4 Maintenance and Testing of an Emergency Action Plan

The dam owner is responsible for issuing the EAP to those affected, as well as for maintaining and updating all registered copies of the EAP.

The dam owner should test the EAP.

As updates or amendments are produced, they should be forwarded to each holder (as listed in the EAP) and acknowledged by the recipient. Telephone numbers and names of contact persons should be updated on a regular basis, at least annually. It is helpful to place the EAP in a loose-leaf binder so that outdated pages can be easily removed and replaced with updated information, to ensure a complete, current and workable plan. A list of plan holders should appear in the EAP.

Testing is an integral part of the EAP to ensure that both the document and the training of involved parties are adequate. Tests can range from a limited table top exercise to a full scale simulation of an emergency and can include multiple failures (domino effect).

F.5 Training

The dam owner should provide training to ensure that dam personnel involved in the EAP are thoroughly familiar with all elements of the EAP, the availability of equipment, and their responsibilities and duties.

This familiarity should be extended to appropriate members of the N.Z. Police, and Civil Defence Officers.

Technically qualified personnel should be trained in problem detection and evaluation and appropriate remedial (emergency and non-emergency) measures.

This training is essential for proper evaluation of developing situations at all levels of responsibility which, initially, is usually based on observations on-site. A sufficient number of people should be trained to ensure adequate coverage at all times. Simulated exercises may prove useful in this training.

F.6 Inundation Studies

An inundation study should be carried out for all dams that clearly require EAP's, and for dams where it is not obvious whether or not an EAP is needed, or where the consequence of classification of dam is in doubt.

The inundation study should be based on assumptions that will indicate all areas that could be flooded for the most severe combination of reasonably possible conditions.

Various dam failure scenarios are normally studied; these cover rapid failure times, large breach sizes and conservative antecedent conditions. The potentially inundated area should be determined and the following conditions considered:

- Fair weather dam failure (piping, earthquake, volcano) at full supply level.
- Design flood with and without failure.
- Inundation maps showing the flooded areas should be prepared. A number of computer programmes are available which can be used successfully to provide the analysis.

Regional Councils have a responsibility for regional scale natural hazard information including flood hazard maps. Where an impact of failure is similar to flood sizes already mapped then existing information may suffice,

Key Emergency People

An easy to find section provided for key emergency contacts

Inspection

A special dam inspection together with appropriate monitoring needs to be carried out as quickly as possible with ongoing surveillance until the emergency is over. A schedule of appropriate inspectors for the dam should be attached as an appendice.

F.7 Risk Assessment

A risk assessment will assist in the development of the consequences of potential hazards associated with the structures, and the likelihood of their occurrence. The risk assessment will assist in the selection of options to remedy, alleviate or mitigate potential impacts as a result of a structural failure of a structure retaining a body of material. The production of a fault tree and an event tree is helpful in representing the effects of various hazards.

APPENDIX G - SAFETY REVIEWS

G.1 Introduction

This Appendix provides expanded guidelines for safety reviews. Almost by definition, safety reviews are applicable to dams with Medium or High Potential Impact, and the recommendations are more applicable to such dams. However, Low Potential Impact dams may warrant assessment to preserve the asset value or earning potential of the dam and require periodic review to assess whether their hazard may have moved into a higher category.

The Appendix focuses on key points but does not cover all details. Reference should be made to other documents as appropriate, using for example the reference list at the end of these Guidelines.

G.2 Personnel

The following lists the key personnel involved, outlines their roles or responsibilities and recommends

basic skill or experience requirements:

- Owner - Whether or not safety reviews are statutorily required (by consent conditions), the Owner must take steps to understand the requirements for safety reviews, plan and budget for their implementation and ensure that they take place. After taking advice as necessary, the Owner must draw up the brief, in accordance with the Compliance Schedule requirements facilitate the review, and most importantly, act on recommendations considered necessary to secure an appropriate level of public safety, avoidance of damage to other property, and protection of environmental security.
- Statutory - Under “warrant of fitness” conditions, Regional Councils will have a responsibility to confirm that safety reviews have been undertaken to satisfactory standards, then ensure that recommendations essential to safety are implemented
- Operators - On behalf of the Owner, Operators will be responsible for providing all available data and relevant information to the Safety Review Team, facilitating inspections including Health and Safety aspects, operating equipment as necessary, and responding fully and frankly to any questions put to them.
- Safety Review - The Technical Specialists making up the Team will carry out the review and report in accordance with the Owner’s brief, Compliance Schedule requirements, and to the highest standards of professional practice. Each specialist must be suitably experienced and senior in the area to be covered, and while “grey hairs” are of considerable value, it is important that each person is technologically up to date because a fundamental part of safety reviews is to assess the dam in the light of current technology. For more complex dams involving several facets, it may be necessary or advisable to involve more than one engineer to ensure adequate coverage of issues. There may also be a need for closely defined specialist inputs in areas such as seismology and earthquake risk. Owners and Regulators need to appreciate that if the Team is not suitably qualified, the

review may not disclose important issues. Members of the original design team may assist by clarifying matters, but should not be included in the Safety Review Team to ensure that an independent and unprotective evaluation is made.

- Peer Reviewers - While a safety review is a form of peer review, some organisations require peer review of the Safety Review Team's work. This applies particularly in the first round where there is a lack of original data. The need for such a review depends on circumstances and affordability, but such peer review is recognised as a sound concept. The Peer Reviewer (or reviewers) in this case needs to have suitably wide experience at least equal to that of the Team and generally will be drawn from the most senior practitioners available.

G.3 Scope of Review and Related Issues

G.3.1 General

The main text summarises the key areas typically considered in a review. Setting aside the difficulties which arise in an "initial" review as discussed in G3.2, the following outlines a more detailed typical scope and related issues:

- fundamentals - assessment of hazards and risk taking into account any existing or proposed catchment changes upstream or downstream
- appraisal of general design standards against modern practice, involving site specific assessment of seismotectonics, flood risk and volcanic risk
- assessment of the site condition of the existing structures
- evaluation of design data and construction methods
- hydrology and - appropriateness of design flood(s) spillway provisions - ability to pass design flood(s)
- spillway performance characteristics, risks of blockage or malfunction, and stability
- acceptability of freeboard
- consequences of no change to spillway
- structural aspects- appropriateness of dam design details for loadings and seepage conditions taking foundation features and performance data into account
- performance under design earthquake(s) and flood(s)
- structural integrity of ancillary structures impacting on safety under all design loading conditions
- equipment - structural adequacy
- functionality and security of operation
- reliability
- reservoir - slide potential
- seiche risk
- downstream - environmental changes affecting potential impact classification

- river bed changes affecting structural or spillway performance
- operational,
 - compliance with essential aspects of Appendix E guidemaintenance and lines and implementation of any previous safety review surveillance aspects recommendations
- reporting
 - see G.4
- emergency
 - prescribe procedures in an emergency planpreparedness - assign responsibility
 - identify all parties involved
 - identify cause, effect, and mitigation
 - locate resources

The Safety Review Team will assess a finer level of detail within these areas.

As a matter of good practice, and to help achieve effective communication or understanding, it is recommended that the Owner or an appointed representative take part in the inspection, and/or that meetings be held during the course of the evaluation, or after supply of a draft review report.

Care is required in setting up the contractual relationship between the owner and the safety reviewer, to ensure the review is complete, and the report is without bias from the Owner, or manager of the facility. In appropriate or draconian liability provisions may unduly influence the judgment and candor of the reviewers to the extent that they may only take an ultra conservative approach and recommend unnecessary additional studies and investigation to cover the slightest uncertainties.

The brief needs to clearly separate the annual performance compliance from other asset management aspects the owner may wish examined.

G.3.2 Initial Reviews

This term applies to old or existing dams reviewed for the first time, which frequently have limited data available on their development history and may also have limited operational records. The key problem with such dams is the lack of data and “where to start”.

In principle, the first step should be to try to establish a data book (or books) which provide the best available knowledge of the dam. The extent to which the Owner does this as a prelude to the review or as part of it, is a matter of choice and circumstances.

An almost inevitable consequence of initial reviews, unless the situation is very straightforward, is that they will involve at least two stages. The first stage will be aimed at putting issues in perspective as can best be judged on available information, and determining areas of uncertainty for further examination. It may be that a potential safety deficiency is identified straight away, in which case appropriate action must be taken. The second stage will often require forensic investigation and monitoring to assess areas of uncertainty. In such cases a realistic lead time to the “Warrant of Fitness” date will be required.

It is important that Owners appreciate the probable need for forensic investigation and its associated cost, and that Consent Authorities appreciate that it may take some time to arrive at realistic conclusions in the case of initial reviews. . Notices to Rectify should reflect the practicality of achieving compliance from a time and cost basis balanced with risk exposure.

G.3.3 Low Potential Impact Dams

Brief and generalised recommendations are outlined in the main text for Low Potential Impact dams. Legislation may not require a “warrant of fitness” for a Low Potential Impact dam, but it is

not in the Owner's interests or society's interests, to ignore dam safety on the basis of the Potential Impact being low. Furthermore, environmental changes may cause a Low Potential Impact dam to be rated in the Medium Potential Impact classification. These Guidelines deal with issues of dam safety. For all classifications of dam, the owner will need to take particular precautionary measures to protect commercial and public relations interests.

There are many dams with a low risk to life or property, notably for community water supply or hydro generation, where the consequences of failure would have serious social or economic effects. Thorough safety reviews of these dams are definitely in the Owner's interests and may well be required to maintain insurability. In such cases an appropriately scoped safety review should be undertaken, based on the foregoing and following advice. These dams are Medium Impact Dams by definition.

G.4 Review Conclusions and Reporting

The extent and standard of reporting should be such as to:

- confirm that the brief has been met fully or exceeded
- comprehensively describe the inspections, findings, forensic work, and related inferences or conclusions
- be easily understood by the Owner and subsequent Reviewers
- present conclusions and recommendations clearly
- confirm compliance requirements have been met and / or what is required to fulfil compliance.

Key conclusions and recommendations which require the most careful consideration are:

- the assessed condition of the dam and appurtenant structures to function satisfactorily in a safe manner according to recognised criteria
- determination of those issues associated with the dam, its appurtenant structures or the catchment which have a potential impact on dam safety
- determination of the most plausible modes of failure for the dam, or its appurtenant structures, and their potential dam safety impact
- an assessment of the dam's performance with respect to these potential modes of failure
- assessment of the Operations and Maintenance procedures (or equivalent documentation) for dam safety application
- areas of uncertainty requiring further assessment
- any areas requiring immediate action with accompanying advice
- prioritisation of recommended actions
-

G.5 Follow-up Action by Owner

The responsibility for acting on the recommendations of the safety review rests with the Owner. The Consent Authority will provide a level of external control and overview. The Owner should take advice as necessary on how best to implement the recommendations. Where the cost implications are high, it may be in the Owner's interests to undertake a higher level of investigation and review before implementing the full detail of recommended works. It may not be necessary to undertake significant works, where an acceptable level of reduction in the potential impact of the issue can be brought about by softer options, such as increased surveillance, and improved emergency preparedness procedures. Where a high level of risk is perceived to apply while matters are being investigated or designed, the Owner should implement such reasonable temporary measures as can be effected to improve the situation after discussion with the Consent Authority (e.g. increasing the frequency of surveillance, lowering the water level or providing temporary auxiliary spillway capacity).

The Consent Authority may issue a Notice to Rectify. Such notice may be to decommission the dam. This would require consents to be sought under the Resource Management Act.