

**Before the Commissioners appointed by Canterbury
Regional Council**

IN THE MATTER OF The Resource Management Act
1991

AND

IN THE MATTER OF Applications CRC062866,
CRC062870, CRC062871 and
CRC062872 by Pukaki Irrigation
Company Limited for permits to
disturb the bed and banks of
Lake Pukaki, Pukaki River and
ephemeral streams to install an
intake structure, siphons, and
discharge structures.

Section 42A Officer's Report of Maria Bartlett

Date of Hearing: 21 September 2009

1. Pukaki Irrigation Company Limited proposes to install infrastructure for a new irrigation scheme, to be utilised by three properties to the south of Lake Pukaki. See Attachment One for a diagram showing the relationship of applications in process for the Pukaki Irrigation Scheme.
2. This report should be read in conjunction with reports prepared for associated water permit applications CRC062842 from Simons Hill Station Limited, CRC062867 from Simons Pass Station Limited, and CRC071362 from Glentanner Station Limited; and discharge permit applications CRC062843 from Simons Hill Station Limited and CRC062869 from Simons Pass Station Limited, which propose to utilise the irrigation scheme infrastructure to be installed.
3. This report should also be read together with the introductory s42A report which gives an overview of all applications presented at this hearing (Report 1), the planning and technical reports on hydrology and minimum flows (Report 2A and 2B), the planning report outlining annual allocations (Report 3) and the reports on cumulative landscape and water quality effects in the catchment (Reports 4 and 5).

INTRODUCTION

4. Pukaki Irrigation Company Ltd (the applicant) has applied for resource consent to:

CRC062866

Construct, maintain and operate an irrigation intake structure at Lake Pukaki, at or about map reference NZMS 260 H38:822-652;

CRC062870

Construct and maintain a pipeline under the Pukaki river between at or about map references NZMS 260 H38:822-637 to H38:827-637;

CRC062871

Construct and maintain a pipeline under three unnamed ephemeral streams, or install culverts in these streams, at or about map references NZMS 260 H38:836-631, H38:843-630 and H38:849-634, or NZMS 260 H38:835-636, H38:845-637 and H38:860-640;

CRC062872

Construct, maintain and operate erosion control and discharge structures in the Pukaki River at or about map references NZMS 260 H38:874-563 and H38:880-540.

See Attachment Two for a map of the location of the proposed activities.

5. The applicant engaged Aqualinc Research Limited to prepare the application and assessment of environmental effects, and SolutionNZ RM Limited to provide further information.
6. A 35 year duration is sought.
7. These are applications for new activities.
8. A site visit was carried out on 4 December 2008, by consents staff of Canterbury Regional Council, Peter Glasson representing Pukaki Irrigation Company Limited. Photographs are not included from the site visit. Attachment Three includes photographs provided by the applicant, and photographs of the intake site taken by myself on 4 January 2009.

Background

9. Applications CRC062866, CRC062870, CRC062871 and CRC062872 were lodged on 14 February 2006, at the same time as water permit and discharge applications CRC062842 and CRC062843 from Simons Hill Station Limited and CRC062867 and CRC062869 from Simons Pass Station Limited. The applications were considered to be notifiable from the date of lodging.
10. CRC062866 proposes two possible intake sites for a new irrigation supply scheme, one in Pukaki Canal (Option 1), at or about map reference NZMS 260 H38:805-641, and one in Lake Pukaki (Option 2). Consent is not required for the intake from Pukaki Canal, as this is an artificial watercourse.
11. On 30 July 2009 the applicant confirmed that the intake location from Lake Pukaki would not be from the notified location of NZMS 260 H38:822-649 at the Pukaki Spillway, but from NZMS 260 H38:822-652, approximately 160 metres north of the spillway, as a result of concerns expressed by Meridian Energy Limited. This change to the intake location was not considered cause for further notification of the application, as there is a reduction in effects on Meridian Energy Limited, and there are no parties adversely affected by the change who had not already submitted on the application.
12. I note that the notified location for works in the bed and banks of ephemeral streams (CRC062871) includes an incorrect map reference for the second crossing point in the third stream listed. The notification specified map reference NZMS 260 H38:860-540, but the actual location shown in the map provided by the applicant refers to map reference NZMS 260 H38:860-640.

13. An alternative intake location for the proposed irrigation supply scheme of the Tekapo Stilling Basin (Option 3) is covered by application CRC082300, lodged by Pukaki Irrigation Company Limited on 21 December 2007. As with the Pukaki Canal option, consent is not required for the intake structure itself.
14. All three possible intake locations are proposed as options, and the applicant will choose the most viable option, at which point application CRC062866 to construct an intake in bed and banks of Lake Pukaki may no longer be required, if the Pukaki Canal option or Tekapo Stilling Basin options are successful. The outcome of the Pukaki Irrigation Company Limited intake related applications will contribute to the decision regarding water permit applications lodged by Simons Hill Station Limited (CRC062842, CRC082304), Simons Pass Station Limited (CRC062867, CRC082311), Glentanner Station Limited (CRC071362, CRC083609) and Classic Properties Limited (CRC070406).
15. CRC062870 is relevant only to Option 1, proposing an intake in the Pukaki Canal. If that option is pursued, it will be necessary to construct a pipeline under the Pukaki River bed.
16. CRC062871 proposes alternative crossing locations for the three unnamed ephemeral streams intercepted by the proposed canal and open race delivery system. For each of the streams there is a lower crossing point associated with Option 1 from the Pukaki Canal and an upper crossing point associated with Option 2 from Lake Pukaki. There is an additional application in process (CRC082300) associated with the Tekapo Stilling Basin intake option (Option 3), which includes crossing of the same streams at different locations again.
17. CRC062872 proposes two discharge locations in the Pukaki River, each designed to discharge up to 1.531 cumecs, which is the rate of take for each of the water permit applications from Simons Hill Station and Simons Pass Station associated with the Pukaki Canal and Lake Pukaki intake options. The upstream discharge location is adjacent to the southwestern boundary of Simons Pass Station, and the lower discharge location is adjacent to Simons Hill Station. These discharge sites are related to both the Pukaki Canal and Lake Pukaki intake options, but will not be required if the Tekapo Stilling Basin option is successful. I also note that, while Glentanner Station is connected with the intake options from Pukaki Canal and Lake Pukaki, Glentanner Station Limited have not applied to discharge water.

Notification and Submissions

18. Applications CRC062866, CRC062870, CRC062871 and CRC062872 were publicly notified on 4 August 2007 with applications to take, use, dam and divert water in the Waitaki Catchment. Details of the notification and wording are contained in Appendix 4 of the introductory s42a report (Report 1).
19. In the 2007 public notification, 19 submissions in total were made on application CRC062866 and 18 submissions on the other three applications. Of the 18 submissions applicable to all the applications:
 - (a) 3 were in support;
 - (b) 13 in opposition; and
 - (c) 2 neither supported nor opposed the application.

The additional submission on CRC062866 was in opposition.

20. A summary of submissions made in response to all applications that were publicly notified at the same time in 2007 are contained in Report 1, Appendix 5. Overall, the key effects of concern to submitters include effects on: ecosystems, water quality, allocations, minimum flows, natural character and landscape, efficiency and cultural values, and generally related to the take, use, damming and diversion of water.
21. Additionally, Table 1 below summarises submissions made individually on these applications, or submissions which raise particular concerns in relation to this proposal.

Submitter	Issues	Support/ Neutral/ Oppose	To be heard
Canterbury Aoraki Conservation Board	Natural character of rivers, wetlands, lakes and their margins, significant indigenous vegetation, habitats of indigenous fauna and threatened species; freshwater habitats generally through the entrainment of unwanted plants and animals; Landscape change from the development of infrastructure and consequent reduction in the naturalness of the landscape.	Oppose	Yes
Meridian Energy Limited	Effects on Meridian infrastructure	Oppose	Yes
L H Shand	Preservation of natural character of lakes, rivers and their margins; protect indigenous flora and fauna;	Oppose	Yes
Dr D Scott	Support irrigation infrastructure development off hydroelectricity canals and further irrigation scheme development generally	Support	Yes
Transit New Zealand	Impact on Transit infrastructure not assessed, piping under the state highway has potential to affect road and reserve due to failure or seepage	Oppose	Yes
Department of Conservation	Fish screening; natural character of rivers, wetlands, lakes and their margins, significant indigenous vegetation, habitats of indigenous fauna and threatened species; freshwater habitats generally through the entrainment of unwanted plants and animals;	Oppose	Yes

Table 1: Summary of submissions on applications CRC062866, CRC062870, CRC062871 and CRC062872

DESCRIPTION OF THE PROPOSED ACTIVITY

22. The applicant has applied to carry out the proposed activities under the following conditions:

CRC062866

- (a) To construct, maintain and operate an irrigation intake structure in the bed and banks of Lake Pukaki, at or about map reference NZMS 260 H38:822-652 (see Attachment Four for a concept plan of the intake);

- (b) To design the intake structure and supply pipeline for a maximum flow rate of 3400 litres per second;
- (c) To install a submersible intake pump and 200mm thick concrete pad on the lake bed below the minimum lake control level of 518.2 metres above mean sea level;
- (d) To install a section of 1300mm pipeline on the lake bed between the minimum lake control level of 518.2 metres above mean sea level and the seasonal minimum lake level;
- (e) To bury a section of 1300mm pipeline under the lake bed from the seasonal minimum lake level to the lake shore;
- (f) To install a shed on the lake shore above the maximum lake control level at 535.5 metres above mean sea level, for the purposes of housing switch gear and a booster pump;
- (g) To complete construction within a period of 2 months;
- (h) To thoroughly wash machinery off-site prior to working work in the bed or banks of the lake, in accordance with Canterbury Regional Council guidelines;
- (i) To design the intake structure and associated structures to reduce visual impact;
- (j) To minimise waste during construction and remove any waste material upon completion of works;

CRC062870

- (a) To construct and maintain a pipeline under the Pukaki river between at or about map references NZMS 260 H38:822-637 to H38:827-637 (see Attachment Four for a concept plan of the siphon under Pukaki River);
- (b) To excavate a trench approximately 500 metres long and 4 metres deep;
- (c) To install a 1200mm concrete encased pipeline at a 4 metre depth below bed level within the river bed;
- (d) To backfill the trench over the installed pipeline with excavated material, compacted to 98% of optimum dry density;
- (e) To restore excavated area to the level of surrounding river bed and cover with river stones consistent with the surrounding river bed;
- (f) To undertake liaison with Meridian Energy Limited regarding timing of works;
- (g) To complete construction within a period of 4 months;
- (h) To maintain access to the Pukaki River for the purposes of river control during construction when the river access road will be closed for a period of 1-2 days;
- (i) To thoroughly wash machinery off-site prior to working work in the bed or banks of the river, in accordance with Canterbury Regional Council guidelines;
- (j) To design the pipeline and associated structures to reduce visual impact;

- (k) To minimise waste during construction and remove any waste material upon completion of works;

CRC062871

- (a) To install a canal and culvert crossing in the bed of an ephemeral stream (Ephemeral Stream 1) at or about map reference NZMS 260 H38:836-631 (Option 1) or H38:835-636 (Option 2) (see Attachment Four for a concept plan of the lined canal to cross over Ephemeral Stream 1 and Ephemeral Stream 2);
- (b) To install a canal and culvert crossing in the bed of an ephemeral stream (Ephemeral Stream 2) at or about map reference NZMS 260 H38:843-630 (Option 1) or H38:845-637 (Option 2);
- (c) To install two 1.2 metre diameter pipes within the beds of Ephemeral Stream 1 and Ephemeral Stream 2, sufficient to carry a flow of 100 litres per second beneath the Pukaki Irrigation Company scheme irrigation supply canal;
- (d) To install armouring in the banks of Ephemeral Stream 1 and Ephemeral Stream 2 around the entrance and exit of culverts for the purposes of erosion protection;
- (e) To construct an irrigation supply canal up to 15 metres wide between the toe of each embankment, up to 5.5 metres wide between the crest of each embankment, and up to 3.5 metres high at the crest of each embankment, across the bed of Ephemeral Stream 1 and Ephemeral Stream 2;
- (f) To use a 500mm thick earth liner within the irrigation supply canal, and additional 300mm gravel cover, to prevent seepage, over the culvert crossing within the bed of Ephemeral Stream 1 and Ephemeral Stream 2;
- (g) To construct and maintain a pipeline under the bed of an ephemeral stream (Ephemeral Stream 3) at or about map reference NZMS 260 H38:849-634 (Option 1) or NZMS 260 H38:860-640 (Option 2);
- (h) To excavate a trench and install a 1200mm concrete encased pipeline within the river bed, at a depth below bed level sufficient to protect against scour from a 1 in 100 year flood event;
- (i) To backfill the trench over the installed pipeline with excavated material, compacted to 98% of optimum dry density;
- (j) To restore excavated area to the level of surrounding river bed and cover with river stones consistent with the surrounding river bed;
- (k) To thoroughly wash machinery off-site prior to working work in the bed or banks of the ephemeral streams, in accordance with Canterbury Regional Council guidelines;
- (l) To design the culvert, pipeline and associated structures to reduce visual impact;
- (m) To minimise waste during construction and remove any waste material upon completion of works;

CRC062872

- (a) To construct, maintain and operate an erosion control and discharge structure in the Pukaki River at or about map references NZMS 260 H38:874-563 and H38:880-540 (no concept plan has been provided for the discharge structure);
- (b) To install two weirs, designed to carry flows of 1,531 litres per second each, concreted rock protection and rip rap within the bed and banks of the river, at the exit of irrigation supply races in each location;
- (c) To excavate a channel from the weir into the river bed;
- (d) To undertake liaison with Meridian Energy Limited regarding timing of works;
- (e) To thoroughly wash machinery off-site prior to working work in the bed or banks of the river, in accordance with Canterbury Regional Council guidelines;
- (f) To design the weir, bank protection and channel to reduce visual impact;
- (g) To minimise waste during construction and remove any waste material upon completion of works;

LEGAL AND PLANNING MATTERS

Consent Requirements

- 23. The consent requirements under the Resource Management Act (RMA), Transitional Regional Plan (TRP) and Proposed Natural Resources Regional Plan (PNRRP) for permits to undertake works in the beds and banks of a waterway are outlined in the introductory s42A report.
- 24. The applications were lodged on 14 February 2006 so both the TRP and PNRRP are applicable when determining status of the proposed activities.
- 25. The TRP does not address matters relating to works in the bed and banks of rivers and lakes in the Waitaki Catchment. As there is no operative regional plan which addresses certain uses of beds of lakes and rivers in the Mackenzie Basin, the proposed activity is a **discretionary** activity and requires resource consent under section 77C(1)(a) of the RMA.
- 26. The proposed PNRRP can be used for guidance when considering an application for works in the beds and margins of lakes and rivers. It is not clear that the proposed activities can comply with permitted activity rules BLR2 or BLR3. As such, the proposed activities are **discretionary** activities in accordance with Rule BLR8 of the proposed NRRP.

Additional Requirements

- 27. The applicant is likely to require an archaeological authority from the Historic Places Trust before installation of the canal associated with Option 1, where that canal will disturb an existing archaeological site.
- 28. The applicant is also likely to require easements and consent from the Commissioner of Crown Lands to undertake the proposed works.

CONSULTATION

29. The applicant has been in consultation with Meridian Energy Limited regarding the intake design, Land Information New Zealand regarding further authorisations that may be required, Department of Conservation regarding ecological values and Transit New Zealand regarding effects on State Highway 8. Details of consultation have not been provided.

DESCRIPTION OF THE AFFECTED ENVIRONMENT

30. *Lake Pukaki*

a) The applicant states:

- i. Outflows and lake levels are controlled by Meridian Energy Limited for hydroelectricity generation purposes.
- ii. The lake surface area is approximately 175 million square metres.
- iii. Lake Pukaki is considered to have high natural character and high landscape and visual amenity values under the Waitaki Catchment Water Allocation Regional Plan (WCWARP).

b) I note that:

- i. Lake Pukaki is a Statutory Acknowledgement Area scheduled in the Ngai Tahu Claims Settlement Act 1998.
- ii. The Pukaki Spillway from Lake Pukaki is approximately 160 metres south of the proposed intake location.
- iii. The proposed intake site is adjacent to a public access road off State Highway 8 leading to a lake viewing area, and will be visible from the Lake Pukaki information centre across the lake to the northwest.
- iv. The minimum lake level for Lake Pukaki is specified as 518 metres above mean sea level in the WCWARP.
- v. The lake has recreational and amenity values associated with water sports and sightseeing.
- vi. Terminal moraine land forms are present adjacent to Lake Pukaki, across the State Highway, within the pipeline route.
- vii. Species present in the lake include: threatened indigenous aquatic plants; a variety of indigenous wading birds and waterfowl, including endangered species; Canterbury galaxias, koaro, common bully and long-finned eels, as well as brown and rainbow trout.¹

31. *Pukaki River*

a) The applicant states:

¹ *Inventory of Instream Values, Daly (2004)*

- i. The Pukaki River is predominantly dry, subject to flow releases over the Lake Pukaki spillway, managed by Meridian Energy Limited, with flows ranging from 0 to 1000 cumecs, and an average release flow of 180 cumecs.
 - ii. The river has limited value recreationally and ecologically.
 - iii. Environment Canterbury maintains a road on the true left bank of the river for river protection and flood management purposes.
- b) I note that:
- i. There are indigenous species present within the bed and banks of the Pukaki River, including: two threatened species of grasshopper (*Sigaus minutes* and *Brachaspis robustus*); bird species such as NZ pipit, grey warbler, banded dotterel and black fronted terns; lizard species such as spotted skink, common skink, McCanns skink and Southern Alps gecko; and patches of indigenous plant species suited to the stony and dry alluvial surfaces, although sweet briar is common.
 - ii. The siphon crossing is adjacent to transmission lines running through the river bed, approximately 1km downstream of the Pukaki spillway and 1.8km east of the Pukaki Canal, with utility access roads in proximity.
 - iii. The discharge weir locations are in an area with few structural elements present, aside from adjacent gravel road, and transmission lines approximately 1.5km upstream of the upper discharge location.

32. *Ephemeral Streams*

- a) The applicant states:
- i. Ephemeral Stream 1 and Ephemeral Stream 2 disappear to gravel soon after the proposed crossing points, and do not flow during the irrigation season.
 - ii. Ephemeral Stream 3 has flowed once in 15 years after heavy rainfall, at a rate of 25L/s for a maximum of a fortnight, with flow disappearing to gravel before reaching Pukaki River, and flow occurring outside the irrigation season. This stream has a larger catchment than Ephemeral Stream 1 and Ephemeral Stream 2.
 - iii. Stream crossing points are stony, with vegetation of mainly hieracium, browntop and danthonia, with low environmental value.
 - iv. Test pit excavations, up to 5m deep, undertaken by Riley Consultants for Pukaki Irrigation Company Limited found that outwash gravels located within the bed of ephemeral watercourses crossed by the proposed irrigation supply canal were moist or occasionally saturated.
- b) I note that:

- i. Width and depth of ephemeral stream beds has not been identified by the applicant, nor have typical flows for Ephemeral Streams 1 and 2.
- ii. The width of Ephemeral Stream 1 appears to be between 220m and 230m at both proposed crossing sites, based on aerial photographs in the CRC GIS system.
- iii. The width of Ephemeral Stream 2 appears to be approximately 130m at the lower crossing point (associated with Option 1) and 160m at the upper crossing point (Option 2).
- iv. The width of Ephemeral Stream 3 appears to be approximately 400m at the lower crossing point (associated with Option 1) and 330m at the upper crossing point (Option 2).
- v. Native species are likely to be present within, and adjacent to, the ephemeral stream beds, including indigenous flora, invertebrates, lizards and birds².
- vi. The 1888 Rabbit Fence, an archaeological site, begins approximately 100 metres southeast of the Option 2 crossing point for Ephemeral Stream 1 and runs approximately 100 metres north of the Option 1 crossing point for Ephemeral Stream 3, with the proposed canal route for Option 1 passing through the fence.

ASSESSMENT OF PROPOSED ACTIVITY

- 33. The proposed water permit is a discretionary activity and must be considered in the context of s104 of the RMA.
- 34. Section 104(1) outlines matters that the consent authority must have regard to when considering an application for resource consent, including any actual and potential effects on the environment, any relevant statutory provisions, and any other matter the consent authority considers relevant.

Assessment of actual and potential effects (s104(1)(a))

- 35. The effects that have been considered for this type of activity (works in the bed of a water body) are presented in the introductory s42A report. That report includes identification of the relevant planning provisions which direct us to consider these effects. A summary table regarding the assessment of individual effects for this application is provided below and a detailed discussion of those outstanding matters or areas of concern is provided in the following sections.
- 36. Where mitigation is referred to in this table, I am referring to the recommended conditions listed at the end of this report. The recommended conditions take into consideration those proposed by the applicant, however may have been re-worded or replaced by conditions used by Environment Canterbury, to ensure conditions are certain and enforceable.

Table 1: Summary of potential adverse effects from this application

Adverse	Applicant's assessment	IO audit	Conclusion
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² Department of Conservation, Conservation Resources Report – Simons Pass, prepared for Land Information New Zealand (May 2008)

Effects			
Water quality and ecosystems	CRC062866 – Intake No assessment	Expect localised water quality effects during 2 month construction period from bed disturbance and sediment discharge; unclear if timing of works an issue for species; washing of equipment prior to works appropriate to prevent spread of pest plants Conditions (6) &(10)-(17)	Effects uncertain
	CRC062870 – River crossing Works undertaken when river is dry; no ecological values affected	4 month duration for construction, risk of flow release during that time; river bed vulnerable to spread of pest plants, washing equipment appropriate; assessment re native flora and fauna prior to works appropriate; avoid nesting birds; use established tracks Conditions (5)-(19), (22) & (23)	Effects minor, subject to conditions
	CRC062871 – Stream crossings Works undertaken when streams are dry; no ecological values affected	Agree that sediment discharge not an issue; washing equipment appropriate to avoid spread of pest plants; assessment re native flora and fauna prior to works appropriate; avoid nesting birds; use established tracks Conditions (5)-(16), (18) & (19)	Effects minor, subject to conditions
	CRC062872 – discharge weirs Works undertaken when river is dry; no ecological values affected; liaison with Meridian regarding timing of works	Risk of flow release during construction and length of time unclear, liaison with Meridian appropriate; river bed vulnerable to spread of pest plants, washing equipment appropriate; assessment re native flora and fauna prior to works appropriate; avoid nesting birds; use established tracks Conditions (5)-(18), (20) & (21)	Effects minor, subject to conditions
Bed erosion and flooding	CRC062866 – Intake Pump and intake below minimum lake control level, erosion protection works to be confirmed; pipeline buried above seasonal lake control level, depth not specified; switch gear shed above maximum lake control level	Erosion protection associated with exposed pipeline; recommend pipeline buried above minimum lake level Conditions (1) & (16)	Effects uncertain
	CRC062870 – River crossing Concreted pipeline to be buried 4m below bed level to survive 1 in 100 year flood event; no	Agree, provided 4m below lowest bed level; note that eastern map reference does not	Effects minor, subject to conditions

	impact on flood carrying capacity; trench to be backfilled and compacted	appear to extend pipeline far enough across the river bed; remedial works to restore bank stability Conditions (1), (2), (5)-(8), (16), (17), (19), (22) & (23)	
	CRC062871 – Stream crossings Ephemeral Streams 1 and 2 to be culverted under canal using two 1.2m diameter pipes, sufficient to carry 100L/s flow; armouring of stream banks upstream and downstream proposed; canal fill sections to be constructed using material of low permeability sourced onsite and lined to prevent seepage, minimising risk of failure causing erosion; Ephemeral Stream 3 to flow over buried pipeline installed at depth below bed level sufficient to protect against 1 in 100 year flood flow	Applicant to identify bed width and depth at each of six proposed sites, and flows in Ephemeral Streams 1 and 2; design details for erosion protection works around culverts not provided; applicant to identify depth below lowest bed level for Ephemeral Stream 3; remedial works to restore bank stability Conditions (1), (2), (5), (12)-(15), (18)-(21)	Effects minor
	CRC062872 – discharge weirs concreted rock protection, rip rap and channel configurations sufficient to protect against erosion at discharge sites; flood carrying capacity of river not affected	Design details of erosion protection works; remedial works to restore bank stability Conditions (1), (5)-(7), (15)-(17) & (20)-(23)	Effects uncertain
Artificial structures	CRC062866 – Intake Liaison with Meridian resulted in shift of intake 160m from Pukaki Spillway; liaison with Transit NZ regarding crossing of SH8 ongoing	Expect localised water quality effects during 2 month construction period from bed disturbance and sediment discharge, which may affect Pukaki Spillway, so consultation with Meridian appropriate; Transit NZ have submitted in opposition to the application due to potential effects on SH8 of pipeline from intake crossing under the highway; expect applicant to indicate compliance with Transit NZ requirements; not directly applicable to bed and banks of Lake Pukaki, but effect of granting intake in that location is SH8 crossing Conditions (1) & (2)	Effects uncertain
	CRC062870 – River crossing Pipeline to pass under Pukaki River access road, road to be closed for up to 2 days, alternative river access to be provided	Expect applicant to provide details of alternative access while river road closed; pipeline route passes through transmission lines, no assessment provided, setback distances and liaison with Transpower required	Effects uncertain

		Conditions (1), (2) & (19)	
	CRC062871 – Stream crossings No assessment provided	Any disturbance of 1888 Rabbit Fence as a result of works will require authorisation from Historic Places Trust Conditions (1) & (2)	Effects uncertain
	CRC062872 – discharge weirs No assessment provided	No neighbouring structures Conditions (1) & (2)	Effects minor
Landscape and Amenity values	CRC062866 – Intake Pipeline to be buried above seasonal minimum lake level; small shed on lake shore to house switch gear	Applicant has not identified the seasonal minimum lake level, and the difference between this and the minimum lake level of 518m a.m.s.l. specified in the WCWARP, risk of pipeline exposure at low lake levels; site adjacent to, but set back from, public viewing area off SH8; switch gear shed will not intrude on view due to set back; activity during works, including heavy machine presence and sediment discharge, will affect amenity at this site, so should consider timing of works; restoration of site and removal of spoil proposed; no details of erosion protection provided to determine ongoing visual impact at the site; buoy to identify intake location would mitigate effects on recreational boaters using the lake Conditions (1), (2), (6)-(10), (14), (16), (19) & (20)	Effects uncertain, further mitigation required
	CRC062870 – River crossing No amenity values identified	Proposal will introduce additional structures within and adjacent to the river bed, but in proximity to other manmade structures, such as access roads, transmission lines, canal and spillway; access road will be closed for up to 2 days Conditions (2), (8), (16), (22) & (23)	Effects minor
	CRC062871 – Stream crossings No amenity values identified	Stream beds are located on pastoral land with few manmade elements; canals and culvert crossings will introduce structures to natural environment affecting landscape; structures likely to be visible from DOC public access track adjacent to SH8 Conditions (1), (2), (12), (18) & (19)	Effects may be more than minor on landscape in this location

	CRC062872 – discharge weirs No amenity values identified	Unmodified landscape in this location, so sensitive to introduction of structures; public access limited Conditions (1), (2), (5), (15), (20) & (21)	Effects may be more than minor on landscape in this location
Tangata Whenua values	CRC062866 – Intake No assessment provided	Lake Pukaki is Statutory Acknowledgement Area; rohe of Arowhenua and Waihao; consultation required; Ngai Tahu have submitted in opposition; accidental discovery protocol appropriate Condition (18)	Effects uncertain
	CRC062870 – River crossing No assessment provided	Ngai Tahu have submitted in opposition; accidental discovery protocol appropriate Condition (20)	Effects uncertain
	CRC062871 – Stream crossings No assessment provided	Ngai Tahu have submitted in opposition; accidental discovery protocol appropriate Condition (17)	Effects uncertain
	CRC062872 – discharge weirs No assessment provided	Ngai Tahu have submitted in opposition; accidental discovery protocol appropriate Condition (19)	Effects uncertain

Table 2: Summary of Assessment of Effects

Effects on water quality and ecosystem values

37. Regarding works proposed for the intake (CRC062866), the applicant has not identified adverse effects of sediment discharge on water quality and ecosystems over the 2 month duration of activity. The method of works has not been discussed, including mitigation measures to be employed with regards to sediment discharge, which may affect aquatic species.
38. Regarding works proposed for the Pukaki River crossing (CRC062870), flow release from the Pukaki spillway during works has the potential to pick up spoil and debris from the works site and carry it downstream. Given that works will occur over a 4 month period, timing the works for low lake level periods is desirable. The applicant may wish to provide information with respect to lake levels that will inform timing of works. Liaison with Meridian Energy Limited during works will be necessary to manage the site and limit the potential for spoil and debris from the site to be picked up by release flows.
39. Regarding works proposed for the Pukaki River (CRC062870, CRC0862872) and ephemeral streams (CRC062871), the applicant has advised that consultation with Department of Conservation staff is ongoing. The DOC Conservation Resources Report for Simons Pass Station identifies indigenous species in the vicinity of works in the Pukaki River and ephemeral streams. Disturbance of indigenous vegetation communities during works could have an adverse effect on those communities, which may be avoided, remedied or mitigated by identifying the locations of those vegetation communities prior to works. Works also have the potential to disturb

nesting birds. Relocating away from significant indigenous vegetation, undertaking works outside of nesting season for indigenous bird species, and working as far as possible from established tracks on the property will minimise disturbance to native flora and fauna.

40. Regarding works proposed for all the applications, the applicant has identified the need to wash equipment off-site, prior to works within the beds of the lake, rivers and streams. Protocols to prevent the spread of didymo have not specifically been mentioned and will be necessary for works in water, affecting Lake Pukaki.
41. In summary, there are potential adverse effects on water quality and ecosystems that have not been identified by the applicant, which are likely to require mitigation. Possible mitigation measures have been noted in the above paragraphs, some of which I have translated into consent conditions; however, there are outstanding concerns regarding effects of sediment discharge on Lake Pukaki with respect to CRC062866 for installation of the intake.

Effects on erosion and flooding

42. Regarding works proposed for the intake (CRC062866), I note that full erosion protection design details have not been provided to date. The applicant proposes erosion protection around the exposed intake structure, below the seasonal minimum lake level, and proposes to bury the pipeline from the intake above the seasonal minimum lake level. Erosion protection around the exposed pipeline is presumably required because of the difference between the minimum lake level of 518m a.m.s.l. (specified in the WCWARP) and the seasonal minimum lake level (a value for which has not been specified), and the effect of fluctuations in lake level within that zone. Exposure of the pipeline above the minimum lake level of 518m a.m.s.l has impacts on amenity values, discussed below, and as such, a pipeline buried below bed level within the zone identified for erosion protection is recommended, which may negate the need for erosion protection measures to mitigate against lake level fluctuation.
43. Regarding works proposed for the Pukaki River crossing (CRC062870), the applicant proposes to bury the pipeline 4 metres below lowest bed level. I have no concerns regarding flood carrying capacity. Flow patterns may be affected during works if stockpiling of material occurs within the riverbed, so a condition stating that there will be no stockpiling is recommended. I note that the eastern map reference provided for the river crossing does not appear to extent the buried pipeline the full width of the riverbed, which would mean the canal and associated intermediary structures between the pipeline (siphon) and canal would be situated on the bed, and therefore in potential flow path of the river. I suspect that the map reference is incorrect, and should be NZMS 260 H38:828-637 rather than H38:827-637.
44. Regarding works proposed for the ephemeral stream crossings (CRC062871), design details have not been provided for erosion protection upstream and downstream of Ephemeral Stream 1 and Ephemeral Stream 2. Regarding flood carrying capacity of the culverts for these streams, stream flows have not been identified, and bed width and depth has not been identified at the two crossing points within each stream. However, the culverts are proposed to consist of two 1.2 diameter pipes, which I am satisfied are of sufficient flood-carrying capacity, and although the bed widths appear to be between 130 and 200m for these streams, flow width is likely to be no more than 2 metres. Regarding Ephemeral Stream 3, the applicant has not identified depth below bed level for installation of the buried pipeline (siphon), although has stated that it will be designed to accommodate a 1 in 100 year event. The depth below

lowest bed level would be recommended as a condition of consent, so needs to be specified by the applicant.

45. Regarding works proposed for the discharge structures in Pukaki River (CRC062872), the applicant proposes concreted rock protection, rip rap and channel configurations sufficient to protect against erosion at the discharge site. Design details for these structures, and the associated erosion protection measures have not been provided in order to assess the measures proposed.
46. In summary, there are potential adverse effects on erosion and flood carrying capacity, which have been identified by the applicant, and mitigation proposed. I am satisfied that effects on erosion and flood carrying capacity for the Pukaki River crossing (CRC062870) and ephemeral stream crossings (CRC062871) are likely to be minor. There remains uncertainty with regards to erosion protection design and requirements for the Lake Pukaki intake (CRC062866), and erosion protection design at the Pukaki River discharge points (CRC062872). Effects may be minor on erosion in these locations, but that cannot be determined without further design detail from the applicant.

Effects on artificial structures

47. The applicant has not addressed effects on adjacent structures covered within the statutory responsibilities of Transit New Zealand, Transpower and the Historic Places Trust, or identified potential adverse effects on these structures from the proposed activities.
48. Regarding works proposed for the Lake Pukaki intake (CRC062866), Meridian Energy Limited have submitted in opposition to the proposed activity based on potential adverse effects on Meridian infrastructure. The applicant has indicated ongoing consultation with Meridian in regards to the proposed activity. Transit New Zealand has submitted in opposition to the proposal, on the basis that the pipeline under SH8 poses a risk to infrastructure, and wishes to be heard. The applicant has indicated some consultation, but no details have been provided.
49. Regarding works proposed for the Pukaki River crossing (CRC062870), Transpower has written a letter to the applicant advising of requirements. At present, the proposal does not appear to comply, as the proposed Pukaki River pipeline route passes under the transmission line. The applicant may wish to address this matter at the hearing. The applicant has identified that the canal crossing the Pukaki River, associated with Option 1 to take from Pukaki Canal, will affect the Pukaki River Road, which will be closed for up to 2 days during installation. The applicant has indicated that access to the river for the purpose of river control and protection works will be maintained, recognising the road provides utility access, although the mode of alternative access has not been explained.
50. Regarding works proposed for the ephemeral stream crossings (CRC062872), Historic Places Trust have advised the applicant, by way of CRC, that an archaeological site assessment is required with regard to effects on the 1888 Rabbit Fence, as part of the consenting process, and that in addition to that, an authority will be required from the Trust, in the event that consent is granted, which will be informed by the same archaeological assessment. I note that Option 1, to construct an open race system from an offtake from the Pukaki Canal, crosses through the Rabbit Fence adjacent to Ephemeral Stream 2.

51. Given the outstanding matters above, I am not in a position to conclude that effects on structures will be minor with regards to applications CRC062866, CRC062870 and CRC062871. I am satisfied that effects on structures of application CRC062872 will be minor.

Effects on landscape and amenity values

52. Regarding works proposed for the intake (CRC062866), amenity values at the public viewing area off SH8 (see Attachment Two for photographs) will be affected during the construction phase, as a result of sediment discharge and presence of materials and heavy machinery, which the applicant has not identified. Potential adverse effects could be mitigated by storage of materials and machinery off-site until required, ongoing removal of waste material, and timing of works outside of periods of high visitor numbers (including weekends and public holidays).
53. Post-construction, provided the switch gear shed is set back from the termination of the access road to the viewing area, then the shed is unlikely to interrupt lake views. Provided also that the intake structure and pipeline is buried or submerged, such that no part is exposed above the water line, then amenity values will be protected. At present there appears to be a discrepancy between the WCWARP minimum lake level of 518m a.m.s.l. and the minimum seasonal lake level specified in the design plans (for which the number of metres above mean sea level has not been identified), which presents a risk of exposure of the pipeline and proposed erosion protection works. This would be likely to be visible from visitor information centre across the lake, and will be prominent at the public viewing area off SH8. Such adverse effects on amenity values could be mitigated through burial of the pipeline below the minimum lake level of 518m a.m.s.l., which is recommended.
54. In terms of recreational users of the lake, a buoy installed at the intake to alert recreational boaters of the existence of a submerged structure will mitigate against potential adverse effects on boaters through accidental collision with the structure.
55. Regarding works proposed for the Pukaki River Crossing (CRC062870), the proposed activity will introduce additional permanent structures within and adjacent to the river bed, but in proximity to other manmade structures, such as access roads, transmission lines, canal and spillway. This is not considered to be an area of high amenity value.
56. Regarding works proposed for the stream crossings (CRC062781) and discharge structures (CRC062872), there are few manmade elements in these locations, where the landscape can be considered to be in a moderately high state of naturalness. Introduction of canals, up to 3.5m high, associated culvert crossings, discharge weirs and erosion protection works will change the perception of naturalness in these locations. I note that there is an alternative proposal, lodged by the applicant, involving an entirely buried pipeline, which will have a lesser impact on landscape values than this proposal.
57. In summary, I am not satisfied that effects of the proposed activities on landscape and amenity values in relation to works proposed for the Lake Pukaki intake structure (CRC062866), the ephemeral stream crossings (CRC062871), and the discharge structures (CRC062782) will be minor. However, I consider that effects of works proposed for the Pukaki River crossing (CRC062870) on these values is not a concern.

Effects on Tangata Whenua values

58. The applicant has not proposed an Accidental Discovery Protocol to be followed during construction and maintenance of structures. I recommend a condition requiring adherence to appropriate protocol in the event that Koiwi Tangata or taonga are uncovered.
59. With respect to other matters of cultural value to Te Runanga o Ngai Tahu, and particularly mana whenua of Te Runanga of Waihao and Te Runanga o Arowhenua, these may be presented by the submitter at this hearing.

Conclusion

60. With regard to s104(1)(a), the actual and potential effects of the proposed activities have been discussed above. For these applications, I am not yet satisfied that actual and potential effects of the proposed activities will be minor.
61. Regarding CRC062866, I have outstanding concerns, for which mitigation has not been identified, with respect to effects on water quality and ecosystems, artificial structures, landscape and amenity values and Tangata Whenua values.
62. Regarding CRC062870, I have outstanding concerns, for which mitigation has not been identified, with respect to effects on artificial structures and Tangata Whenua values.
63. Regarding CRC062871, I have outstanding concerns, for which mitigation has not been identified, with respect to effects on artificial structures, landscape and amenity values, and Tangata Whenua values.
64. Regarding CRC062872, I have outstanding concerns, for which mitigation has not been identified, with respect to effects on landscape and amenity values, and Tangata Whenua values. Relevant

Statutory Provisions (s104(1)(b))

National Policy Statement on Electricity Transmission (NPS)

65. The National Policy Statement on Electricity Transmission has been operative since 10 April 2008.
66. Policy 10 of the NPS states:

“In achieving the purpose of the Act, decision-makers must to the extent reasonably possible manage activities to avoid reverse sensitivity effects on the electricity transmission network and to ensure that operation, maintenance, upgrading, and development of the electricity transmission network is not compromised.”
67. Policy 11 of the NPS states:

“Local authorities must consult with the operator of the national grid, to identify an appropriate buffer corridor within which it can be expected that sensitive activities will generally not be provided for in plans and/or given resource consent. To assist local authorities to identify these corridors, they may request the operator of the national grid to provide local authorities with its medium to long-term plans for

the alteration or upgrading of each affected section of the national grid (so as to facilitate the long-term strategic planning of the grid)."

68. The applicant has not identified an appropriate corridor for the proposal to construct a pipeline within the bed of the Pukaki River. Resource consent cannot be granted without addressing effects on Transpower with regards to operation and maintenance of the transmission line.

Regional Policy Statement (RPS)

69. Under Section 104(1)(b)(iii) of the RMA, the consent authority shall have regard to any relevant regional policy statement. The Canterbury Regional Policy Statement has been operative since 26 June 1998.
70. Of significance to these applications is Chapter 10, which relates to the management of the beds of lakes and rivers and their margins. Policy 1 requires identification of areas of natural character, significant habitats of indigenous flora and fauna, significant natural features and landscapes, and significant heritage values, with the requirement that activities avoid effects on these conservation values. Policy 3 requires that indigenous riparian vegetation be retained to enhance conservation values. The applicant has not adequately addressed these matters to date.
71. Policy 4 requires that adverse effects on flood carrying capacity are avoided or mitigated, which the applicant has addressed. Policy 6 relates to the stability or performance of essential structures, which has not been addressed by the applicant in relation to the transmission line. Policy 7 relates to public access, relevant to the Pukaki River road.

Proposed Natural Resources Regional Plan (PNRRP)

72. The objectives and policies of the PNRRP that are relevant to each potential adverse effect have been identified in the introductory s42 report.
73. Of particular relevance to this application is Objective BLR1, which seeks to ensure that the activities do not restrict flood carrying capacity; erode the bed or banks of rivers, result in an increase in undesirable or pest plant infestation, or adversely effect natural character, outstanding natural features and landscapes, or indigenous habitats and species. Objective BLR2 further seeks to ensure that the habitats of breeding birds and indigenous fauna are not disrupted or damaged by human activity. I am not yet satisfied that these objectives will be met in relation to the proposed activities, particularly with respect to natural character and landscape. Mitigation has been identified to protect indigenous habitats and species, with the exception of the effects of sediment discharge from installation of the Lake Pukaki intake structure.

Part II Purpose and Principles

Purpose of the RMA (s5)

74. Under Section 104, the consent authority must consider applications "subject to part II" of the RMA. The purpose of the RMA (Section 5(1)) is to:
- "promote the sustainable management of natural and physical resources."*
75. The proposal will allow the development of land to occur, which may provide for the economic and social well-being of the community. The applicant however has not proposed measures to "avoid, remedy or mitigate" the potential impacts on water

quality and ecosystems, artificial structures, landscape and amenity, and Tangata Whenua values, as required in Section 5(2)(c).

Matters of National Importance (s6)

76. Regarding application CRC062866, sub-sections (a), (b), (c) and (e) of Section 6 of the RMA are particularly relevant to this application. The proposal includes a change in natural character on the margin of Lake Pukaki, which is within an area of outstanding natural landscape. The proposal may adversely affect habitats of significant indigenous species of flora and fauna. The relationship of Tangata Whenua to the waters of Lake Pukaki may be affected.
77. Regarding application CRC062870, sub-sections (c) and (e) of Section 6 of the RMA are particularly relevant to this application. The proposal may adversely affect habitats of significant indigenous species of flora and fauna. The relationship of Tangata Whenua to their ancestral lands and water may be affected.
78. Regarding application CRC062871, sub-sections (a), (b), (c), (e) and (f) of Section 6 of the RMA are particularly relevant to this application. The proposal includes a change in natural character on the margin of ephemeral streams, which are within an area of outstanding natural landscape. The proposal may adversely affect habitats of significant indigenous species of flora and fauna. The 1888 Rabbit Fence is not protected under the existing proposal. The relationship of Tangata Whenua to their ancestral lands and water may be affected.
79. Regarding application CRC062872, sub-sections (a), (b), (c), and (e) of Section 6 of the RMA are particularly relevant to this application. The proposal includes a change in natural character on the margin of the Pukaki River, which is within an area of outstanding natural landscape. The proposal may adversely affect habitats of significant indigenous species of flora and fauna. The relationship of Tangata Whenua to their ancestral lands and water may be affected.

Other Matters (Section 7)

80. In achieving the purpose of the RMA, the consent authority is directed to have particular regard to a number of matters as set out in (a) – (j) of Section 7.
81. Regarding application CRC062866, sub-sections (a), (c), and (h) are particularly relevant to this application. Kaitiakitanga is relevant to management of the discharge of sediment over the 2 months of works. The maintenance of amenity values is relevant to management of the works site during construction and the design of the intake to reduce visual impact. Protection of the habitat of trout and salmon is relevant to sediment discharge in the vicinity of works.
82. Regarding application CRC062870, sub-sections (a) and (d) are particularly relevant to this application. Kaitiakitanga is relevant to management of the works site over the 4 months of works to minimise potential adverse effects of river flow releases carrying sediment and debris from the site downstream. The intrinsic values of ecosystems are to be regarded as the river bed and margins provide habitat for populations of threatened indigenous flora and fauna.
83. Regarding application CRC062871, sub-sections (a), (c), (d) and (f) are particularly relevant to this application. Kaitiakitanga is relevant to the choice between the proposed Options 1 and 2 for the irrigation scheme, which involve an open canal system in relation to this application, and the proposed Option 3, which involves a buried pipeline across these same streams. The maintenance of amenity values is

relevant to the visual impact of the proposed activity in this location. The intrinsic values of ecosystems are to be regarded as the stream bed and margins provide habitat for populations of threatened indigenous flora and fauna. Maintenance of the quality of the environment is important in relation to impacts on the moderately high state of naturalness of the environment in this location, the qualities of which may be reduced by the proposal to a lower state of naturalness.

84. Regarding application CRC062872, sub-sections (a), (c), (d) and (f) are particularly relevant to this application. Kaitiakitanga is relevant to the choice between the proposed Options 1 and 2 for the irrigation scheme, which involve discharge structures in relation to this application, and the proposed Option 3, which would not require discharge structures. The maintenance of amenity values is relevant to the visual impact of the proposed activity in this location. The intrinsic values of ecosystems are to be regarded as the river and its margins provide habitat for populations of threatened indigenous flora and fauna. Maintenance of the quality of the environment is important in relation to impacts on the moderately high state of naturalness of the environment in this location, the qualities of which may be reduced by the proposal to a lower state of naturalness.

Principles of the Treaty of Waitangi (s8)

100. Section 8 of the RMA requires the consent authority to take into account the principles of the Treaty of Waitangi. The site lies within the rohe of Te Runanga o Arowhenua and Te Runanga o Waihao. Te Runanga o Ngai Tahu have submitted in opposition to the application and has requested to be heard.

RECOMMENDATION

Grant or Refuse

85. Section 104B applies to any application which is a discretionary or non-complying activity and states that the consent authority may grant or refuse the application and may impose conditions under s108.
86. The applicant proposes to construct an open race irrigation system, with some piped sections, either abstracting water from Lake Pukaki or the Pukaki Canal, and has proposed some mitigation with respect to the four activities requiring consent. Additional mitigation measures have been identified to address some of the effects of the proposed activities, but there remain effects without identified mitigation.
87. Regarding CRC062866, I have outstanding concerns, for which mitigation has not been identified, with respect to effects on water quality and ecosystems, artificial structures, landscape and amenity values and Tangata Whenua values, and as such, I cannot recommend that the application be granted.
88. Regarding CRC062870, I have outstanding concerns, for which mitigation has not been identified, with respect to effects on artificial structures and Tangata Whenua values, and as such, I cannot recommend that the application be granted.
89. Regarding CRC062871, I have outstanding concerns, for which mitigation has not been identified, with respect to effects on artificial structures, landscape and amenity values, and Tangata Whenua values, and as such, I cannot recommend that the application be granted.
90. Regarding CRC062872, I have outstanding concerns, for which mitigation has not been identified, with respect to effects on landscape and amenity values, and

Tangata Whenua values, and as such, I cannot recommend that the application be granted.

RECOMMENDED CONDITIONS

91. Comments on the mitigation proposed by the applicant for each application are provided earlier in this report.
92. If the Commissioners decide to grant this application, a list of conditions that are usually included in a permit to disturb the bed and banks of a waterway, and explanation for their inclusion, are provided in Appendix 6 of the introductory s42A report. A list of conditions for these applications are included below, however, it should be noted that there are gaps in some conditions, and it is not clear that these conditions address all the outstanding matters of concern. The italicised conditions are shorthand, with the full condition listed against the unique identifier in Appendix 6.

CRC062866 – Intake in Lake Pukaki

Scope

LU01

1. a) Works in the bed and banks of Lake Pukaki shall be limited to construction, maintenance and operation of:
 - i. an irrigation intake structure, consisting of a submersible pump and 1300mm diameter pipeline, sufficient to carry a maximum flow of 3400 litres per second;
 - ii. erosion protection works, consisting of
- b) The irrigation intake structure described in 1(a) shall be buried above the minimum lake level of 518 metres above mean sea level to a depth of [] metres below ground level.
2. *LU03* Excavation shall not exceed a depth of [] metre(s) below the level of the natural lake bed prior to excavation.

Location

LU2

3. Works shall only be carried out within the bed and banks of Lake Pukaki between map reference NZMS 260 H38:822-659 and H38:xxx-xxx, which will enable the proposed intake structure to extend below the minimum lake level of 518 metres above mean sea level.

Prior to works

4. *LU08 Consent given to all on site*
5. The Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager shall be notified not less than 48 hours prior to the commencement of works.

Works/Construction

6. Works to install the intake structure and erosion protection described in Condition 1 shall take no longer than 2 months to complete.
7. Works shall not be carried out on weekends or public holidays.

8. *LU06* If further excavation at the site, within the bed or banks of the lake, is not to occur within seven days following the last working at the site, then the following shall occur:
 - a. All deposits of gravel, sand and other natural material shall be levelled to the natural level of the lake bed and banks;
 - b. The excavation area shall be reshaped and formed to a state consistent with the surrounding natural lake bed and banks; and
 - c. Reject material shall be removed from the lake bed and banks.
9. There shall be no stockpiling of materials at the works site.
10. *LU21 Storage of fuel...the bed and banks of Lake Pukaki.*
11. Cement shall be stored securely or removed from site overnight.
12. Machinery shall be free of plants and plant seeds prior to arrival at the works site, and prior to use within the lake bed.
13. To prevent the spread of Didymo or any other aquatic pest, the consent holder shall ensure that activities authorised by this consent are undertaken in accordance with the Biosecurity New Zealand's hygiene procedures. Note: You can access the most current version of these procedures from the Biosecurity New Zealand website <http://www.biosecurity.govt.nz> or Environment Canterbury Customer Services
14. *LU23 Minimise adverse effects on various values*
15. *LU011 No erosion of bed and banks - Lake Pukaki.*
16. All practicable measures shall be undertaken to minimise the discharge of sediment to Lake Pukaki, arising from the works, including, but not limited to [.....].
17. Works in water shall be kept to the minimum practicable to undertake the works.

Accidental Discovery Protocol

18. *LU09 Arowhenua Runanga and Waihao Runanga*

Upon Completion

19. *LU27 Remove spoil and waste material*
20. Upon completion of works, the site shall be restored to its original condition, as far as is practicable.

Administration

21. *AD05 Review*
22. *AD06 Lapse*

CRC062870 – Pipeline across the Pukaki River

Scope

LU01

1. a) Works in the bed and banks of the Pukaki River shall be limited to construction, maintenance and operation of an irrigation supply pipeline, including:
 - i. excavation of a trench up to [] metres wide, 500 metres long, and 5.3 metres deep; and
 - ii. installation of a concrete encased 1200mm diameter pipeline
- b) The pipeline described in 1(a) shall be buried to a depth of 4 metres below lowest bed level.

Location

2. *LU2* Works shall only be carried out within the bed and banks of Pukaki River between map references NZMS 260 H38:822-637 to H38:828-637, to ensure the buried pipeline extends the full width of the river bed.

Prior to works

3. *LU08 Consent given to all on site*
4. The Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager shall be notified not less than 48 hours prior to the commencement of works.

Works/Construction

5. Works to install the intake structure and erosion protection described in Condition 1 shall take no longer than 4 months to complete.
6. If the applicant is aware that flow release from Pukaki Spillway is planned within the next 48 hours, then the following shall occur:
 - a. All deposits of gravel, sand and other natural material shall be levelled to the natural bed level; and
 - b. Reject material and equipment shall be removed from the river bed; and
 - c. Measures shall be undertaken to prevent the discharge of sediment to Pukaki River arising from the works.
7. *LU06* If further excavation at the site, within the bed or banks of the river, is not to occur within seven days following the last working at the site, then the following shall occur:
 - a. All deposits of gravel, sand and other natural material shall be levelled to the natural bed level; and
 - b. The excavation area shall be reshaped and formed to a state consistent with the surrounding natural river bed; and
 - c. Reject material shall be removed from the river bed
8. There shall be no stockpiling of materials within the bed or banks of the river.
9. *LU16 Out of flowing water*
10. *LU21 Storage of fuel*
11. Cement shall be stored securely or removed from site overnight
12. Machinery shall be free of plants and plant seeds prior to arrival at the works site, and prior to use within the river bed.
13. To prevent the spread of Didymo or any other aquatic pest, the consent holder shall ensure that activities authorised by this consent are undertaken in accordance with the Biosecurity New Zealand's hygiene procedures. Note: You can access the most current version of these procedures from the Biosecurity New Zealand website <http://www.biosecurity.govt.nz> or Environment Canterbury Customer Services.
14. Habitats and communities of significant indigenous flora, including threatened species, present within the site of works shall be identified prior to commencement of works, and all practicable measures shall be undertaken to avoid effects on species identified.
15. Works shall occur, as far as practicable, from established access roads and tracks, to minimise disturbance of flora and fauna present within, and adjacent to, the site of works.
16. *LU23 Minimise adverse effects on various values*
17. *LU011 No erosion of bed and banks – Pukaki River*
18. Works shall not occur when birds are nesting or rearing their young within 100 metres of the site of works.

19. Access to the Pukaki River for the purposes of river engineering, erosion control and flood protection shall be maintained throughout the period of works.

Accidental Discovery Protocol

20. *LU09 Arowhenua Runanga and Waihao Runanga*

Upon Completion

21. After installation of the pipeline described in Condition 1, the trench shall be backfilled over the pipeline with excavated material, compacted to 98% of optimum dry density.
22. *LU27 Remove spoil and waste material*
23. Upon completion of works, the site shall be restored to its original condition, as far as is practicable, including, but not limited to, levelling the excavated area to the level of surrounding river bed and covering the area with river stones consistent with the surrounding river bed.

Administration

24. *AD05 Review*
25. *AD06 Lapse*

CRC062871 – Ephemeral stream crossings

Scope

LU01

1. Works in the bed and banks of ephemeral streams shall be limited to installation, maintenance and operation of three irrigation supply canal crossings, including:
 - a) installation of two 1200mm diameter culvert pipes, to pass beneath the irrigation supply canal, within the bed of the first and second ephemeral streams; and
 - b) construction of an irrigation supply canal up to 15 metres wide between the toe of each embankment, up to 5.5 metres wide between the crest of each embankment, and up to 3.5 metres high at the crest of each embankment, across the bed of the first and second ephemeral streams; and
 - c) Installation of erosion protection works within the bed and banks of the first and second ephemeral streams, upstream and downstream of the proposed canal crossing, including [...]; and
 - d) installation of a concrete encased 1200mm pipeline at a depth of [] metres below the lowest bed level, under the bed of the third ephemeral stream, to act as a siphon between two sections of the irrigation supply canal.

Location

2.
 - a) Works described in 1(a) and 1(b) above shall only be carried out within the bed and banks of the first ephemeral stream at map reference NZMS 260 H38:836-631 or map reference NZMS 260 H38:835-636, and within the bed and banks of the second ephemeral stream at map reference NZMS 260 H38:843-630 or map reference NZMS 260 H38:845-637.
 - b) Works described in 1(c) above shall only be carried out within the bed and banks of the third ephemeral stream at map reference NZMS 260 H38:849-634 or map reference NZMS 260 H38:860-640.

Prior to works

3. *LU08 Consent given to all on site*
4. The Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager shall be notified not less than 48 hours prior to the commencement of works.

Works/Construction

5. There shall be no stockpiling of materials within the bed or banks of ephemeral streams.
6. *LU16 Out of flowing water*
7. *LU21 Storage of fuel*
8. Cement shall be stored securely or removed from site overnight
9. Machinery shall be free of plants and plant seeds prior to arrival at the works site, and prior to use within the bed of ephemeral streams.
10. Habitats and communities of significant indigenous flora, including threatened species, present within the site of works shall be identified prior to commencement of works, and all practicable measures shall be undertaken to avoid effects on species identified.
11. Works shall occur, as far as practicable, from established access roads and tracks, to minimise disturbance of flora and fauna present within, and adjacent to, the site of works.
12. *LU23 Minimise adverse effects on various values*
13. *LU011 No erosion of bed and banks – ephemeral streams*
14. Works shall not adversely affect the flood carrying capacity of ephemeral streams.
15. Batters and side castings formed shall be stabilised by appropriate measures such as seeding, re-vegetation, compacting and/or drainage.
16. Works shall not occur when birds are nesting or rearing their young within 100 metres of the site of works.

Accidental Discovery Protocol

17. *LU09 Arowhenua Runanga and Waihao Runanga*

Upon Completion

18. *LU27 Remove spoil and waste material*
19. Upon completion of works in the third ephemeral stream, the site shall be restored to its original condition, as far as is practicable, including, but not limited to, levelling the excavated area to the level of surrounding river bed and covering the area with river stones consistent with the surrounding river bed.

Operation and maintenance

20. The culverts shall be maintained in good working order.
21. In the event of any damage to the canals, culverts or pipeline, the consent holder shall maintain the flood carrying capacity of the affected ephemeral stream and take all practicable measures to minimise erosion.

Administration

22. *AD05 Review*
23. *AD06 Lapse*

CRC062872 – Discharge sites in Pukaki River

Scope

LU01

1. Works in the bed and banks of Pukaki River shall be limited to installation, maintenance and operation of two discharge structures, and associated erosion protection works, including:
 - a) installation of two weirs, up to [] metres wide and up to [] metres high, designed to carry flows of 1,531 litres per second each, at the exit of irrigation supply races in two locations; and
 - b) installation of concreted rock protection within the banks of the river, within an area up to [] metres wide and up to [] metres long, immediately downstream of each weir; and
 - c) installation of rock rip rap within the banks of the river, within an area up to [] metres wide and [] metres long, immediately downstream of each area of concreted rock protection; and
 - d) excavation of a discharge channel up to [] metres wide, [] metres deep and [] metres long, immediately downstream of each weir.

Location

2. Works described in Condition 1 above shall only be carried out within the bed and banks of Pukaki River at map reference NZMS 260 H38:874-563 and H38:880-540.

Prior to works

3. *LU08 Consent given to all on site*
4. The Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager shall be notified not less than 48 hours prior to the commencement of works.

Works/Construction

5. If the applicant is aware that flow release from Pukaki Spillway is planned within the next 48 hours, then the following shall occur:
 - a) All deposits of gravel, sand and other natural material shall be levelled to the natural bed level; and
 - b) Reject material and equipment shall be removed from the river bed; and
 - c) Measures shall be undertaken to prevent the discharge of sediment to Pukaki River arising from the works.
6. *LU06* If further excavation at the site, within the bed or banks of the river, is not to occur within seven days following the last working at the site, then the following shall occur:
 - a) All deposits of gravel, sand and other natural material shall be levelled to the natural bed level; and
 - b) The excavation area shall be reshaped and formed to a state consistent with the surrounding natural river bed; and
 - c) Reject material shall be removed from the river bed
7. There shall be no stockpiling of materials within the bed or banks of Pukaki River.
8. *LU16 Out of flowing water*
9. *LU21 Storage of fuel*
10. Cement shall be stored securely or removed from site overnight
11. Machinery shall be free of plants and plant seeds prior to arrival at the works site, and prior to use within the bed of ephemeral streams.

12. To prevent the spread of Didymo or any other aquatic pest, the consent holder shall ensure that activities authorised by this consent are undertaken in accordance with the Biosecurity New Zealand's hygiene procedures. Note: You can access the most current version of these procedures from the Biosecurity New Zealand website <http://www.biosecurity.govt.nz> or Environment Canterbury Customer Services
13. Habitats and communities of significant indigenous flora, including threatened species, present within the site of works shall be identified prior to commencement of works, and all practicable measures shall be undertaken to avoid effects on species identified.
14. Works shall occur, as far as practicable, from established access roads and tracks, to minimise disturbance of flora and fauna present within, and adjacent to, the site of works.
15. *LU23 Minimise adverse effects on various values*
16. *LU011 No erosion of bed and banks – Pukaki River*
17. Works shall not adversely affect the flood carrying capacity of Pukaki River.
18. Works shall not occur when birds are nesting or rearing their young within 100 metres of the site of works

Accidental Discovery Protocol

19. *LU09 Arowhenua Runanga and Waihao Runanga*

Upon Completion

20. *LU27 Remove spoil and waste material*
21. Upon completion of works, the site adjacent to installed structures shall be restored to its original condition, as far as is practicable.

Operation and maintenance

22. The weirs and erosion protection works shall be maintained in good working order.
23. In the event of any damage to the weirs and erosion protection works, the consent holder shall maintain the flood carrying capacity of the Pukaki River and take all practicable measures to minimise erosion.

Administration

24. *AD05 Review*
25. *AD06 Lapse*



Signed: _____

Date: 28 August 2009

Maria Bartlett
Consents Investigating Officer

REFERENCES

Canterbury Regional Council 2004. Proposed Natural Resources Regional Plan – Chapter 6: Beds and margins of Lakes and Rivers

Canterbury Regional Council 1998. Regional Policy Statement. Report No R98/4. ISBN 1-86937-337-5.

Canterbury Regional Council 1991. Transitional Regional Plan. October 1991.

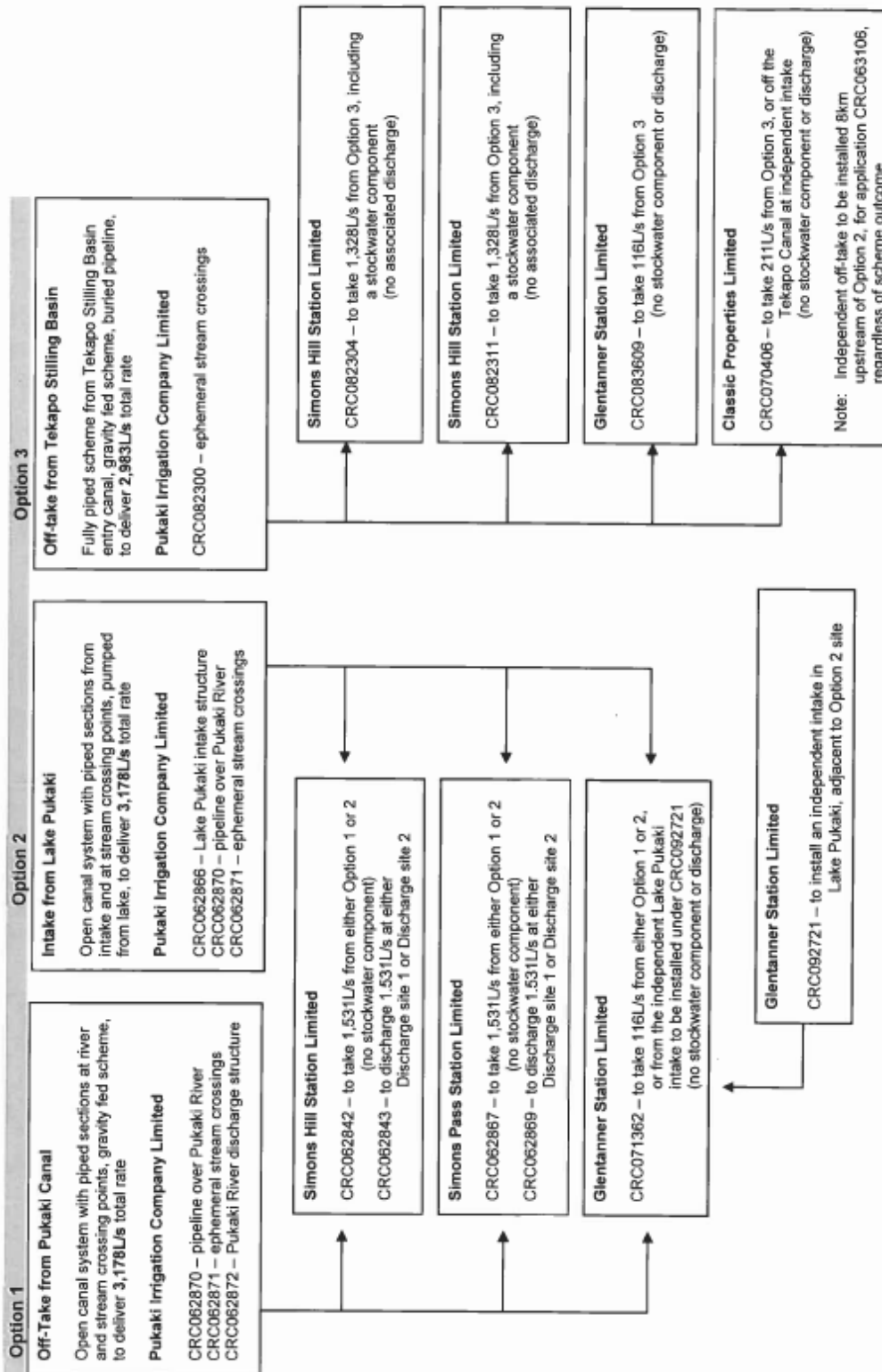
Department of Conservation, Conservation Resources Report – Simons Pass, prepared for Land Information New Zealand (May 2008)

Inventory of Instream values for Rivers & Lakes of Canterbury New Zealand Daly, A (April 2004), Canterbury Regional Council unpublished report U04/13

The Resource Management Act 1991. Consolidated version including the Resource Management Amendment Act 1995. August 2005.

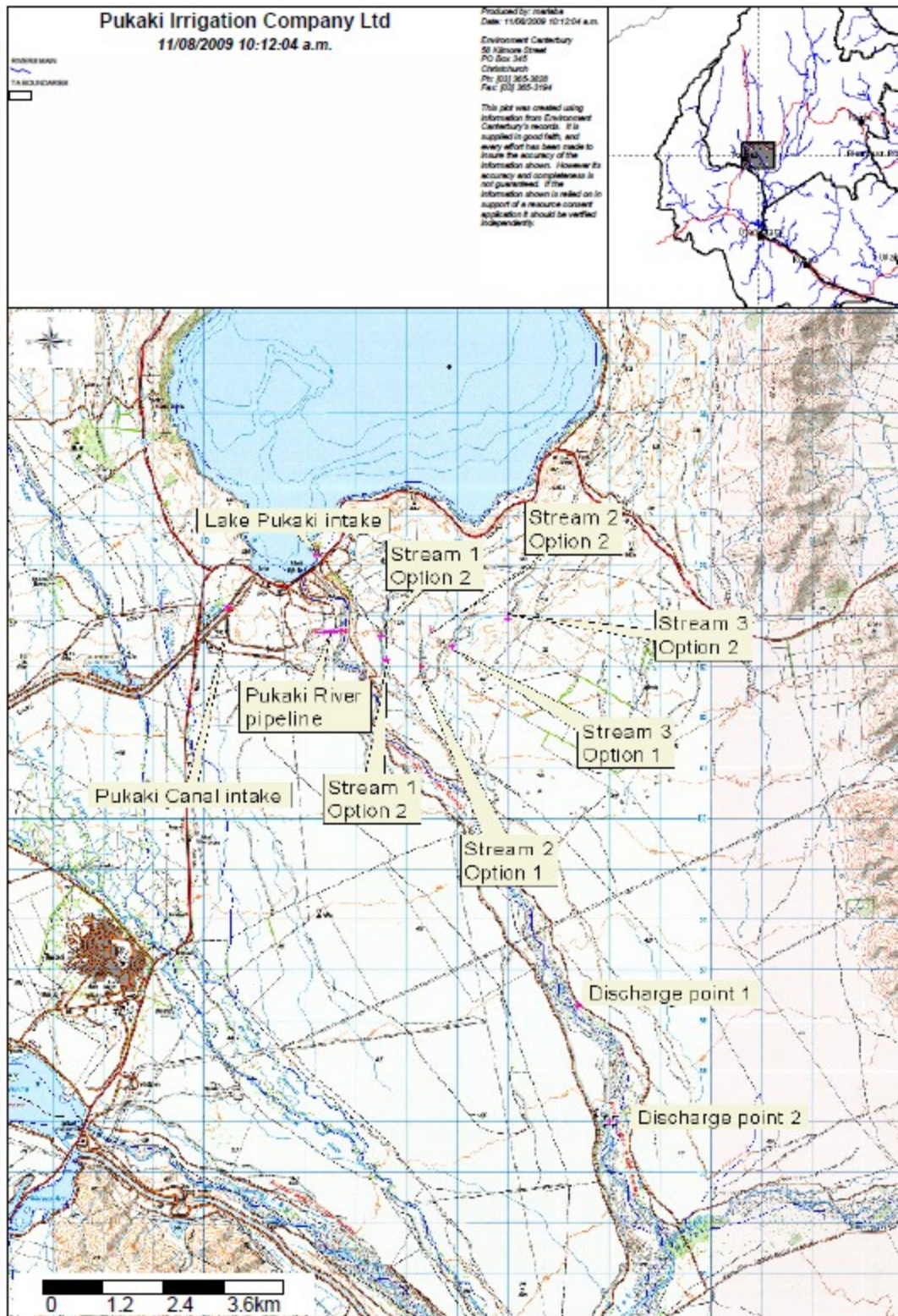
ATTACHMENT ONE: PUKAKI IRRIGATION SCHEME

This diagram shows the relationship of applications lodged by all applicants that are part of the scheme.

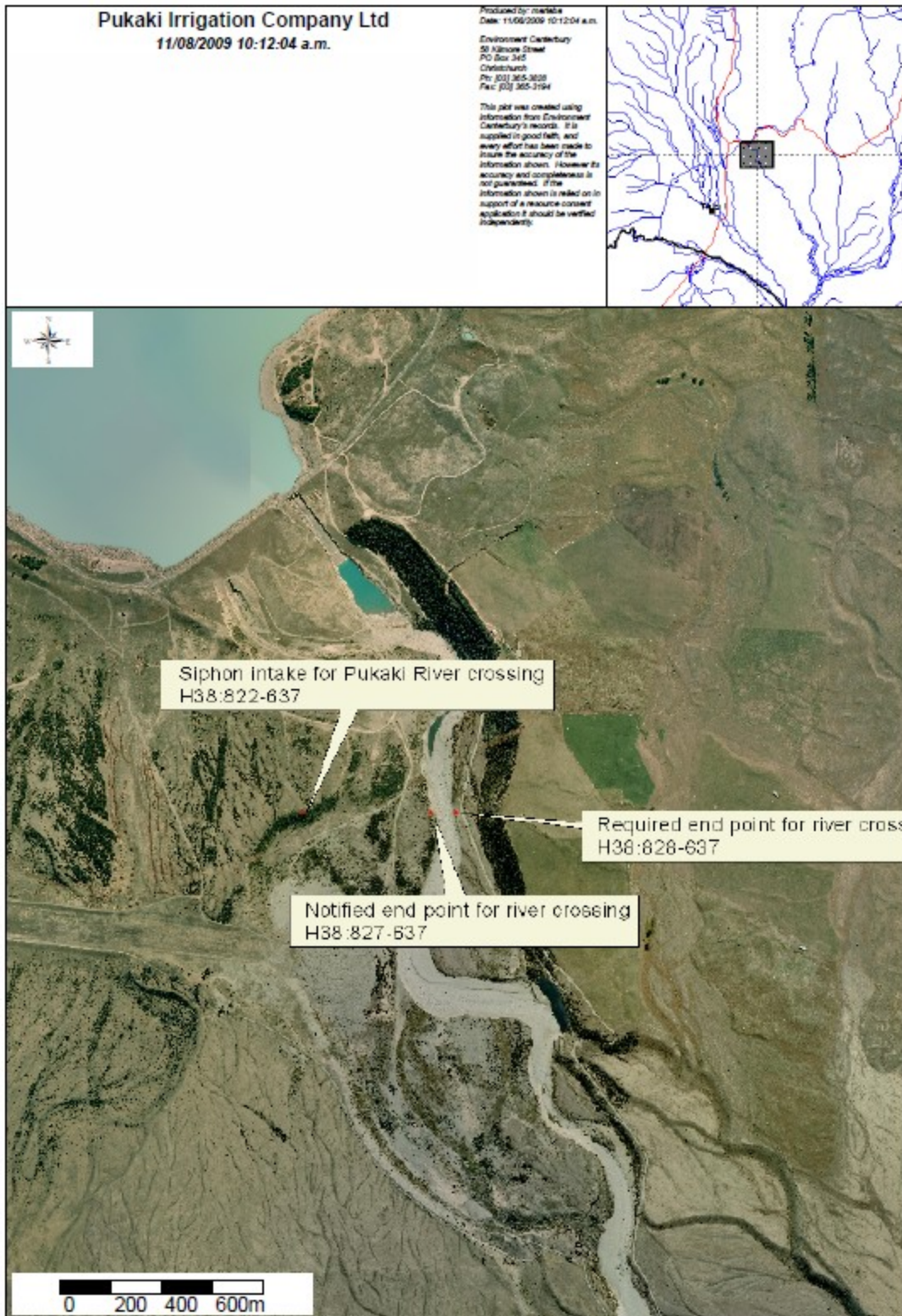


ATTACHMENT TWO – LOCATION MAPS

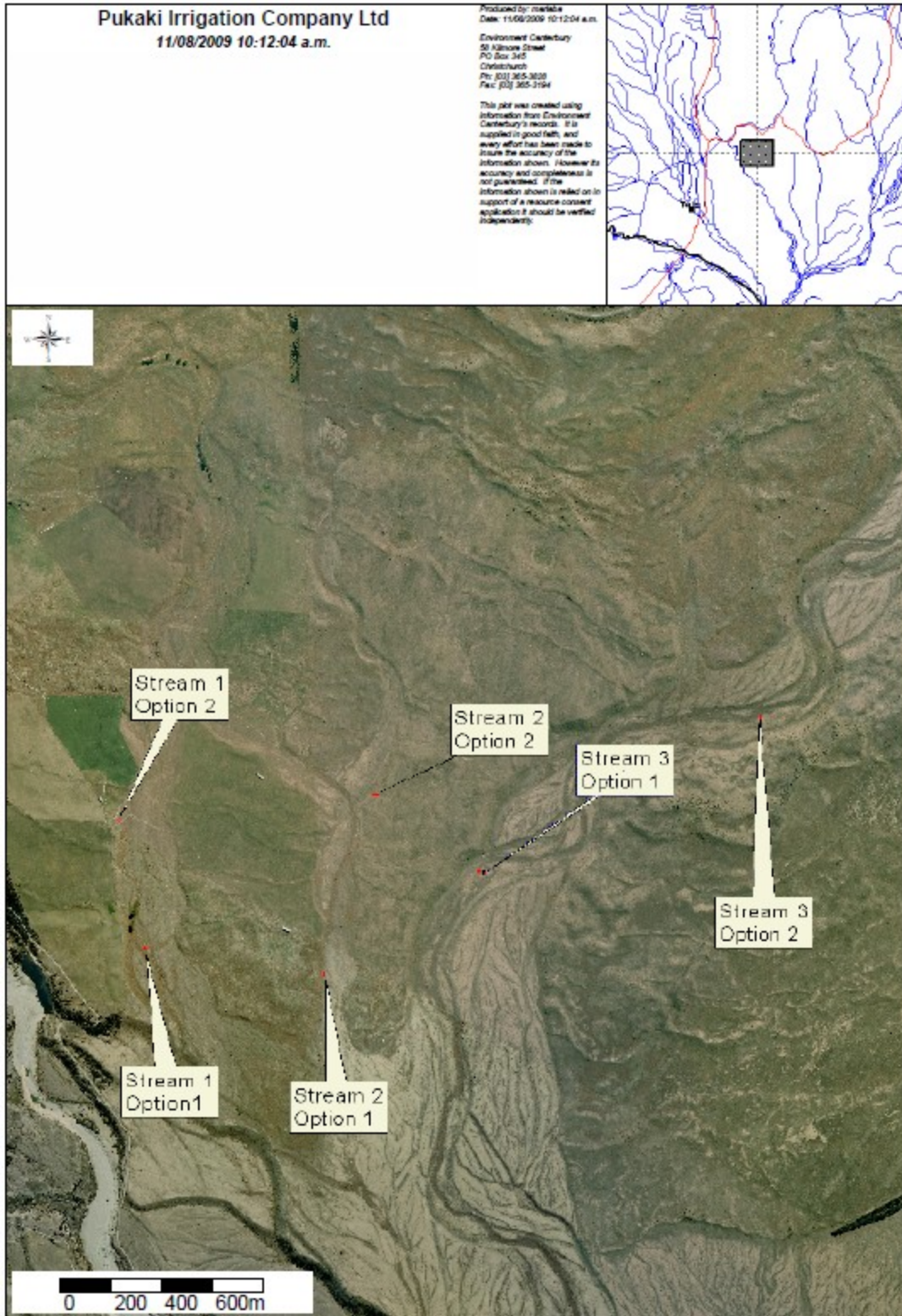
Overall relationship of proposed activities



Aerial photographic view showing Pukaki River crossing points.

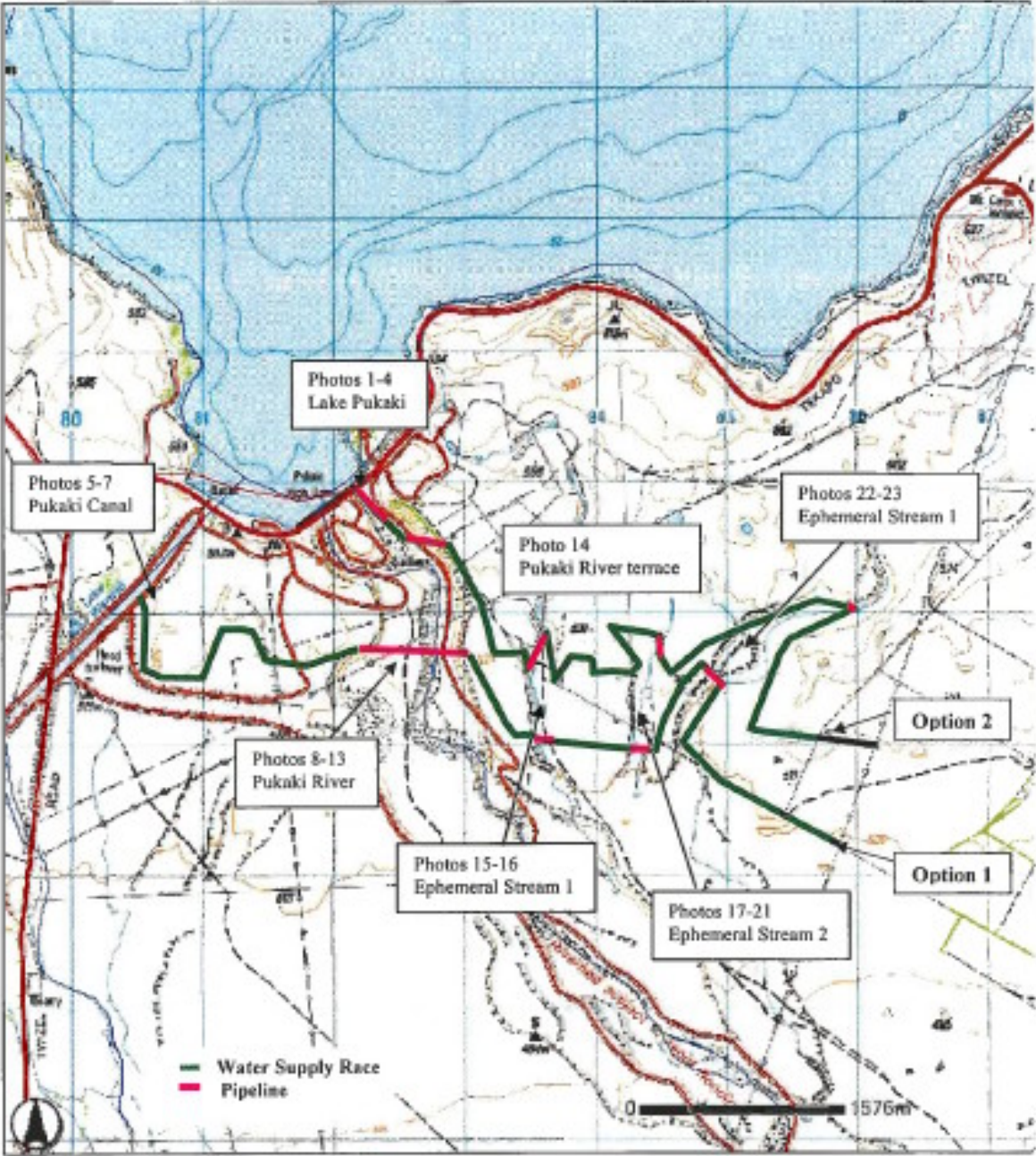


Aerial photographic view showing ephemeral stream crossings



points.

Irrigation supply canal routes as supplied by the applicant on 18 December 2006.



ATTACHMENT THREE – PHOTOS OF SITE LOCATIONS

Lake Pukaki intake

Photos taken by Maria Bartlett during site visit to Glentanner Station on 4 February 2009. Proposed intake location for Pukaki Irrigation Company Limited is now adjacent to the independent intake site proposed by Glentanner Station Limited.



Photos 1 -3 – Views from the proposed intake location across Lake Pukaki to the visitor centre off State Highway 8 - Spillway in Photo 1, rip rap in the foreground of Photo 2, and grassy slope in Photo 3 at approximate location of intake where rip rap finishes



Photo 4 – shows the proposed intake site, with public access road to lake viewing site visible, including holiday camper at the end of the road



Photo 4 – View from the proposed intake site back to the state highway and the gentle rise that leads to Glentanner Station.

Pukaki River crossing

Photographs supplied by the applicant on 18 December 2006.



Photo 11: Pukaki River – standing on east bank of river bed looking west



Photo 12: Pukaki River – standing on east bank of river bed looking east



Photo 13: Pukaki River – standing on east terrace looking west

Pukaki River terrace – approximate location of benching of canal



Photo 14: Pukaki River terrace

Ephemeral Stream 1 crossing point

Photographs supplied by the applicant on 18 December 2006 – not specified whether this is Option 1 or Option 2 crossing point.



Photo 15: Ephemeral Stream 1 – standing on west bank looking east



Photo 16: Ephemeral Stream 1 – standing on east bank looking west

Ephemeral Stream 2 crossing point

Photographs supplied by the applicant on 18 December 2006 – not specified whether this is Option 1 or Option 2 crossing point.



Photo 17: Ephemeral Stream 2 standing on west bank looking north (upstream)



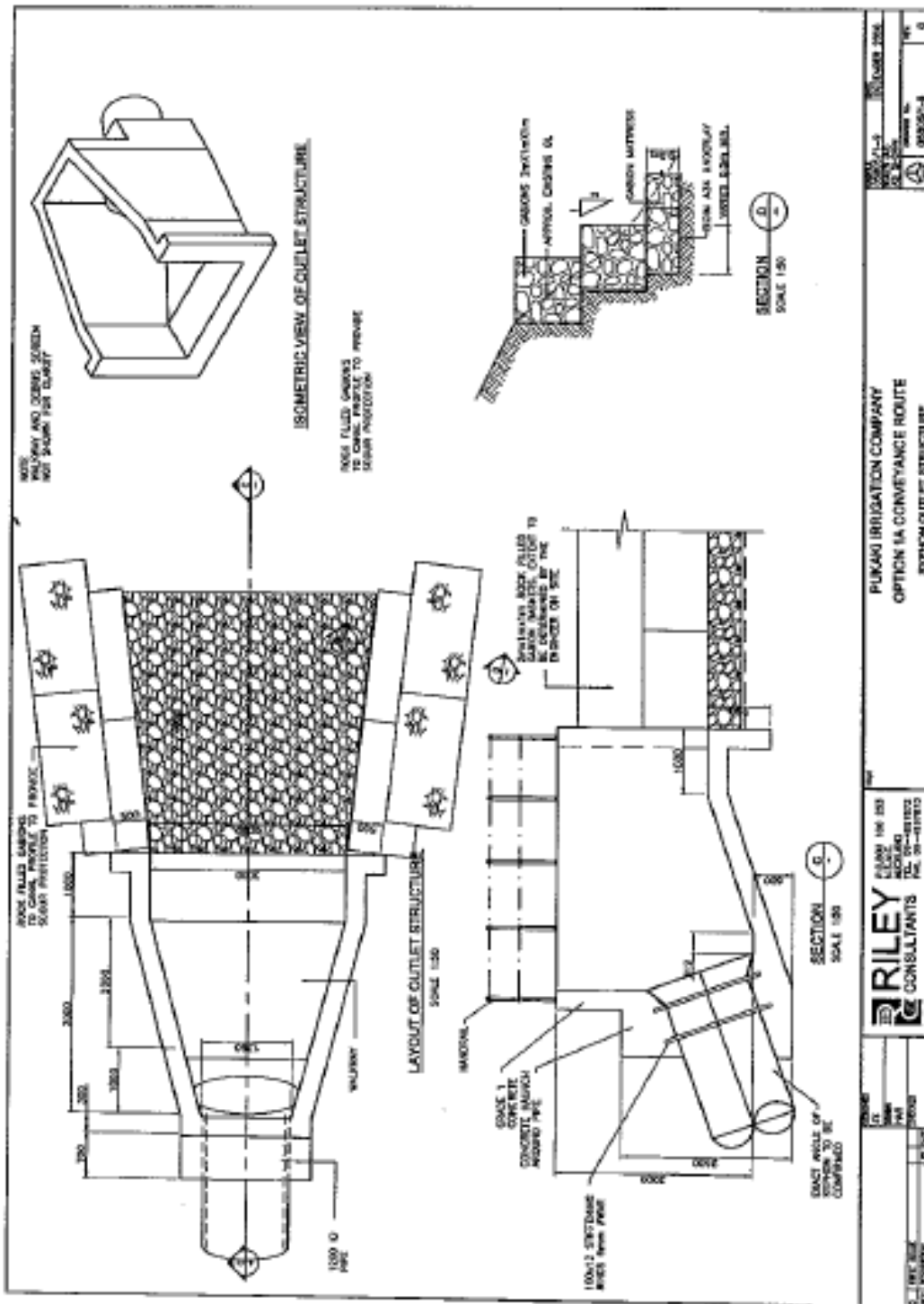
Photo 18: Ephemeral Stream 2 – standing on west bank looking northeast (upstream)

Ephemeral Stream 3 crossing point

Photographs supplied by the applicant on 18 December 2006 – not specified whether this is Option 1 or Option 2 crossing point.



Photo 22: Ephemeral Stream 3 – standing on west bank looking east



		RILEY CONSULTANTS CONSULTANTS No. 28-2111110	
PROJECT NO. 06062-4	DRAWING NO. 06062-4-1	DATE 15 FEBRUARY 2004	SHEET NO. 0
PUKAKI IRRIGATION COMPANY OPTION 1A CONVEYANCE ROUTE SYPHON OUTLET STRUCTURE			

Ephemeral Stream crossings

The concept plan for a lined canal is relevant to the canal crossing of Ephemeral Stream 1 and Ephemeral Stream 2.

