

IN THE MATTER OF The Resource Management Act
1991

AND

IN THE MATTER OF Proposed Variation 1 of Proposed
Canterbury Land and Water
Regional Plan

STATEMENT OF ELLESMERE IRRIGATION SOCIETY INCORPORATED

2 October 2014

Contact: Mrs Carey Barnett

Contact Details: Tel 03 3243429 Lakeside, R D 3, Leeston 7683

1. INTRODUCTION

- 1.1 This statement is provided in support of submissions and further submissions lodged on Proposed Variation 1 of the Proposed Canterbury Land and Water Regional Plan (hereafter referred to as 'the Variation') Sections 1 to 4, Schedules and Maps by the Ellesmere Irrigation Society Incorporated (hereafter referred to as 'the Society').
- 1.2 The Society will be available to answer questions during its time allocation period at the hearing and provide some supporting information relating to this statement. The statement has been set out in a way that indicates to the Hearing Commissioners what the Society's concerns are in relation to the various parts of the Variation via its submissions and its opinion on the recommendations made in the Section 42A Officer's Report.

2. BACKGROUND OF THE SUBMITTER

- 2.1 The Society is made up of approximately 120 consent holders of groundwater and surface water take and use permits located between the Rakaia and Selwyn Rivers and east of State Highway 1 to the east coast. This area is located within the existing Rakaia Selwyn Groundwater Allocation Zone, Selwyn-Waihora Nutrient Allocation Zone and Little Rakaia Nutrient Allocation Zone under the provisions of the Plan. It encompasses the rural areas known as Irwell, Doyleston, Leeston, Lakeside, Sedgemere, Southbridge, Killinchy and Little Rakaia, which are commonly referred to collectively as 'Ellesmere'. **Annexure A** attached shows the location of this area.
- 2.2 The Society was formed in 2009 in order to provide a collective representation on water related issues, predominantly in respect to irrigation and the protection and maintenance of the water resource, both ground and surface water, within the Ellesmere area of the Canterbury Region. The Society also encapsulates the area of consent holders Environment Canterbury (hereafter referred to as 'CRC') determined to be within the Cluster 2, 4 and 5 Groups as part of the Rakaia Selwyn Groundwater Allocation Zone Resource Consent Review.
- 2.3 Members of the Society are predominantly 'family farmers'. Family farmers are farmers who have owned and managed the same property for several generations and have a natural affinity to the land, its use and its protection. Traditionally these types of farmers have engaged in long-term farming practices that utilise environmentally sustainable farming systems. They perceive farming as a long-term plan to retain their heritage and livelihood so that it can be progressed through future generations. A key characteristic of the family farmer is operating in an efficient and caring manner with strong environmental ethics and stewardship. Family farms are predominantly financed through production from the farm itself and are not subject to many off-farm shareholders or corporate investment. Therefore finance and production is very carefully managed. Inefficient use of fertiliser or water is considered costly to these types of farmers and therefore used sparingly under stringent management and application systems. Historically, the family farmer cares greatly for their farm, its produce, livestock and surrounding environs. They have high level expertise and

acquired local knowledge which is often vastly more comprehensive than the small amount of "scientific" data that has been collected over a relatively short time frame. The farm is seen as not only an asset to the owner but also to the community and its immediate physical and social environment; all of which it aims to protect and maintain to its highest quality.

The Society Committee

2.4 The Society presently consists of nine elected Committee Members:

Mr Simon Osborne	Chairman, also member of the Leeston Drainage Committee and arable farmer at Leeston;
Mr Stuart McPherson	Vice Chairman, arable farmer at Sedgemere, Committee Member of Ellesmere Agricultural and Pastoral Association;
Mr David Birkett	Treasurer, also Chairman of the Board of Directors of the Foundation for Arable Research (FAR), Vice Chairman of the Herbage Seed Section of Federated Farmers NZ, Member of the Seed Quality Management Authority Board, Committee Member of Ellesmere Agricultural and Pastoral Association and arable farmer at Leeston;
Mrs Carey Barnett	Secretary, previously had professional experience as: an Environmental Planner for the Selwyn District Council (4 years – Team Leader Consents); and Senior Planner and Principal of environmental consulting firm Boffa Miskell Limited (9 years), currently member of the Harts Creek Restoration Committee, part of arable farming partnership at Lakeside;
Mr Geoff Heslop	Committee Member, Vice Chairman of Blackcurrants New Zealand, Past-President of the Ellesmere Agricultural and Pastoral Association, arable and blackcurrant farmer at Brookside;
Mr Craig Croft	Committee Member and Communications, arable farmer at Lakeside and Assistant Principal of Shirley Boys High School;
Mr Stuart Stephens	Committee Member, Director of Blackcurrants New Zealand, Committee Member of Ellesmere Agricultural and Pastoral Association, and arable and blackcurrant farmer at Irwell;
Ms Jo Jermyn	Committee Member and Publicity Officer, previously Communications Manager at Merino Inc, previously Media Coordinator at PGG Wrightson Seeds, arable farmer at Southbridge;
Mr Chris Green	Committee Member, dairy farmer at Killinchy.

- 2.5 Up until our recent Annual General Meeting Mr John Sunckell was the Society's Vice-Chairperson, him being also a member of the Selwyn Waihora Zone Committee, Chairman of the Leeston Drainage Committee and dairy farmer at Brookside.
- 2.6 Some of the above Society Committee will be present and available at the hearing to provide further information and/or answer questions from the Hearing Commissioners.

Overriding Concerns

- 2.7 The Society has a significant interest in the management of the social, economic and physical environment at the local, regional and national level. In this regard it has been an active entity in recent years being involved in many different focus groups, consultation and submitting on the numerous documents that aim to regulate and deal with the issues of fresh water quantity and quality.
- 2.8 The over-riding critical issue for the Society is ensuring that the Variation encapsulates and reflects the intensions of the Canterbury Water Management Strategy (CWMS) and provides a robust, practical and appropriate framework in which to not only protect all facets of the environment – including social, economic, cultural and physical, but at the same time actually work in practice. The Society considers that the strategies within the CWMS reflect a sound way forward for the future sustainable management of fresh water for all entities, including the physical, social, cultural and economic environment.
- 2.9 One of the key facets of the CWMS is enabling a 90 to 95 percent reliability of irrigation water supply to agricultural users. Without this reliability there would be serious reductions in agricultural production in the Canterbury region. The production in the region contributes substantially to New Zealand's overall production, and as a consequence the economic viability of the country as a whole. The Ellesmere area includes a variety of agricultural land uses such as arable (wheat, barley, ryegrass, clover, small seed such as radish, carrot, kale), vegetables for market, blackcurrant and berry crops, sheep, beef and dairy. All of these uses require certainty of water supply. Therefore the need to ensure a very high level of reliability is critical across the board. This need is reflected in the CWMS and must also be recognised and provided for in the PLWRP and the Variation.
- 2.10 What has been evident in the past, and another key concern of the Society, is the large disparity between how farming activities operate on the ground and the application of the rules that regulate any significantly adverse environmental effects. In other words, the implementation of regulations that do not 'marry up' easily with what actually happens in the physical and farming environment. The rules tend to regulate in a way that makes it difficult to operate and implement 'on the ground'. From what is contained within the Variation it appears that this may also happen again. It is doubtful also that 90 to 95 percent irrigation reliability would be achieved under the rules as they are currently proposed.

3. SUBMISSIONS AND COMMENTS ON OFFICER RECOMMENDATIONS – VARIATION 1 TO THE PROPOSED CANTERBURY LAND AND WATER REGIONAL PLAN

3.1 The following table shows the submissions the Society made in respect to specific provisions set out in Variation 1 of the Proposed Canterbury Land and Water Regional Plan. Stated in blue is the recommendation made by the Officer reporting on behalf of Environment Canterbury (hereafter referred to as ‘CRC’) and alongside, also in blue, a response to that recommendation as stated by the Ellesmere Irrigation Society Inc.

Section	Page Number	Paragraph	Ellesmere Irrigation Society Statement on Section 42A Officer Report
Section 42A Officer Report Chapter 1 – The Selwyn Te Waihora Catchment – An Overview	1 and 2	1.5 and 1.6	While there is variance in the weather patterns that relate to this area, it is noted that this has always been the case with sustained dry periods but also considerable wet periods. A good example of this is the rainfall that has occurred since March this year. March and April together were the wettest combined months for this part of the year since records began. This posed major problems for the harvest of arable and vegetable crops during this period. Some crops were simply abandoned and not harvested while others were partially harvested or harvested with significant damage with little financial return. This indicates that high water tables at this time of year prove problematic for not only harvest but then the ability to sow further crop immediately afterwards. Such extended wet periods are not uncommon but more generally come in winter and having a large impact on the flows of spring-fed streams in terms of recharge. This impact is considerably more than the impact placed on streams by irrigation throughout the catchment.
Section 42A Officer Report Chapter 1 – The Selwyn Te Waihora Catchment – An Overview	3	Figure 1 and paragraph 1.10	Figure 1 and the percentages contained on this page are now out of date. Further work has been done recently by the Sustainable Land and Water Group which shows the current land uses in this area. This information should form the basis of the provisions of Variation 1.
Section 42A Officer Report Chapter 1 – The Selwyn Te Waihora Catchment – An Overview, Lowland Streams/Banks Peninsula Streams	6	Paragraph 1.22	The last sentence of this paragraph says that “ <i>Spring-fed streams are often characterised by the variable management practices around them</i> ”. Further clarification is sought with respect of the meaning of this. It is our experience that largely the flows in the streams are very much dependent on the winter rainfall recharge they gain. Up until the last two years winter recharge has been lower and thus flows have been less. However recently the flows have improved because of the significant winter rainfall that has occurred. While cumulative irrigation throughout the entire catchment will have an impact it will not be the more dominant. Winter weather patterns in the last two to three years have been more aligned to those experienced during the 1970’s when there were continuous wetter winters and hotter summers. Management practices around the streams are less likely to have an impact unless it relates directly to the allowance of intensive stock in the waterway itself i.e. dairy cattle. However, these practices now are minor and not limited to lowland spring-fed streams.
The Drainage Network		Paragraph 1.25	Drains were developed in order to intercept the shallow water table during high rainfall periods and transport any excess water away. Drains during summer periods do not support water flows or habitat because the water table has dropped. It would be significantly detrimental to farming practices to have water flowing in drains during summer periods as this would mean that the water table was too high and conditions too wet to grow/harvest some crops or run summer stock.
Te Waihora/Lake Ellesmere		Paragraph 1.26	One of the key issues with the nature of the lake and its ability to ‘flush’ is that it is difficult to open and release flow to the sea. This is because opening of the lake has to be done manually and is not supported by a permanent opening. Once opened the lake can easily and quickly close itself as build-up of gravels, stones and beach sediment redistribute back into the exit point of the lake to then make a physical barrier and hence closes the lake up again. Over the several decades this has occurred, and the loss of the macrophyte beds during the Wahine Storm the lake’s trophic levels have increased. Neither of these two events/practices are driven by agriculture but rather equate to natural occurrences. However, it is these two events that have had and continue to have a major impact on the state of the lake. They need to be recognised as the most significant impacts.
Section 42A Officer Report Chapter 1 – The Selwyn Te Waihora Catchment – An Overview, Cultural, Social and Economic characteristics.			
Zone Demographics and Communities	8	Paragraph 1.33	It is noted that land uses that potentially contaminate water supplies come from a variety of activities which include industrial, commercial and domestic activities and are not limited to agricultural activities.
Water Based Recreation	8-9	Paragraphs 1.34-1.36	Of the lowland streams in the Ellesmere area only Harts Creek is known to have any real levels of recreational use and this is in the area between the Timberyard Road flow metering point to the outlet to the lake. This is because in this area there is a developed public walkway and access to the Creek is more manageable for fishing and bird watching. There are considerably less opportunities for recreational activities along this creek and the others within this area when compared to the lake areas such as the Selwyn Huts, Rakaia Huts and Lakeside Domain. This is not because of any perceived problems with the flows of the streams or their levels of nutrients but simply because of their accessibility and the nature of surrounding topography. Simply put, they are not easy to reach, they do not have public accessways built along them and vegetation near them does not lend itself to recreational activity i.e. restoration planting of natives prevents access for fishing etc. As an example of recreation requests along Harts Creek, one of the adjoining landowners, Barnett Partnership, only witnesses two separate recreational uses of the adjacent Harts Creek per year, one day a year for duck shooting and one day for eeling. No fishing or bird watching requests are made. Less recreational demands occur at other adjacent properties due to the topography and location of the remainder of the creek. Consequently the recreation values are mainly concentrated east of Timberyard Road and nearest the lake.
Economic Activity	9	Paragraphs 1.37-1.39	Economic activity and its contribution to the growing surrounding region is of great significance and of no less importance than the other characteristics in this area. The contribution of agriculture to the region and New Zealand as a whole here is major and therefore essential to the nation’s economic stability and growth. This is a critical point to acknowledge when developing provisions for sustainable management of resources and maintaining and improving social, economic, cultural and physical outcomes.

Section 42A Officer Report Chapter 2 – The Cultural Significance of Te Waihora/Lake Ellesmere	11-13	Paragraph 2.7	In consulting with local runanga with respect to Te Waiwhakaheketupapaku – regarding a spring head water burial site in which significant tupuna were buried, it is understood that this place was for washing and transporting the bodies and not for their burial within the stream itself.
Section 42A Officer Report Chapter 4 – Zone Committee Role in Process	25	Paragraphs 4.42 and 4.67, 4.72 – 4.74	<p>The Cultural Values, Flow and Water Management Issues for the Waikirikiri/Selwyn – Te Waihora Catchments Report (COMAR) was not completed until 2014 and was not part of the community discussions that were undertaken in 2013 regarding the Cultural Landscape/Values Management Area (CLVMA). It was presented to the Zone Committee without discussion in the wider community. The CLVMA was not addressed until much later through the Zone Committee and not made public for consultation by the wider community until Variation 1 was publically notified. The areas were included in the First Schedule version of Variation 1 to which the wider community and interest groups were not permitted to comment on. After feedback during this consultation phase the Variation was notified. The Society considers that there was no ability to provide feedback on the proposed cultural areas until the notification of the Variation and that this was contrary to the previous consultation phases of the proposed provisions. This can be verified in the Minutes of the Zone Committee Meetings.</p> <p>The Society has also been proactive in trying to consult with Ngai Tahu representatives and did so during a 2013 meeting with Terrianna Smith, Chris Brown and David O’Connell. At no point during this meeting did these representatives mention the development of the COMAR which as it turns out was taking place at that time. Neither was there mention of what was going to be requested as CLVMA via the Zone Committee late in the development process.</p>
Section 42A Officer Report Chapter 5 – Limit Setting Process – Technical Review	47-67	All paragraphs	This section relies on modelled data that does not necessarily reflect what actually happens in reality. Data entered into these models cannot be relied upon because there has been little actual aquifer testing done to determine what the right values of components are to insert into the models i.e. aquifer testing. As just one example, aquifer testing in the Ellesmere area has shown that transmissivity levels alone used by CRC hydrologists are considerably different in reality to what is used by CRC to inform these models. Only recently has there been irrigation water use metering information available to only semi-inform the levels of water used at this stage. Several more years are required in order to fully determine the actual water used in the Selwyn – Te Waihora sub-zone.
	60	Paragraphs 6.42- 6.49	The CLVMA do not form part of the COMAR document and therefore were not consulted on during the scenarios phase and the River Zone maps were not notified as part of Variation 1.

Section of Variation 1	Page of Variation 1	Paragraph	EISI Support or Oppose	EISI Decision Requested	EISI Reason provided for in submission	Section 42A Officer Recommendation	EISI Comments on Officer Recommendation
Section 4 – Amendments to Section 11 – Selwyn - Waihora							
Section 11 – Selwyn Waihora	4-3	Fifth on this page	Oppose	Amend sixth bullet point as follows: “A 50 percent reduction in the catchment phosphorus load”.	The level of reduction for phosphorus is excessive and not in line with what is proposed for nitrogen loading. ‘Good management practice’ is a better way to deal with phosphorus in a catchment. Setting a 50 percent reduction goal within the lifetime of this plan is unlikely to be achievable and is also unrealistic.	No change on this point.	While there may be a 50 percent reduction specified in the ZIP Addendum this does not preclude changes being made to Variation 1. There are presently no measureable calculations made of the phosphorus levels in the catchment and therefore attributing a 50 percent reduction cannot be realistically quantified let alone be achieved. This is why the specified level of reduction has been requested to be removed. EISI retains its stance in relation to this submission point.
Section 11 – Selwyn Waihora	4-3	Sixth on this page	Oppose	Insert following sentence at the end of the sixth paragraph on this page: “It is also recognised that this improvement will take time beyond the life of this Plan”.	The actions included in the package will not be achieved within the lifetime of this plan without significant additional work being undertaken within Te Waihora/Lake Ellesmere itself. This work being done relies on funding from several different agencies and the ability of the associated actions to succeed. This realism needs to be recognised in the plan.	No change on this point and this submission point was not addressed in the S42A Officer Report.	EISI retains its stance in relation to this submission point.
Section 11.1A – Selwyn Waihora Sub-Regional Section Definitions	4-4	Definition – <i>Baseline land use</i>	Oppose	Delete this definition and make any consequential amendments.	It is inappropriate to use a baseline approach that pre-dates the plan provisions and unnecessarily restricts future land uses.	No change proposed.	It is considered that there is sufficient scope within a number of submissions to allow for the changes proposed by submitters. There is also scope to change the rules that refer to the ‘baseline’ and yet still retain the definition in the PLWRP. There are major issues around imposing this baseline and its implications for not only developing farming enterprises but also for existing ones. The Society makes the following points: 1. A number of submitters have recognised the problems of implementing the baseline averaging when farms are in a development phase. Such phases are not ‘one offs’. Most farms are in a continued phase of some sort of development. While conversion to dairying from arable is considered one type of major development, there are often other

Section of Variation 1	Page of Variation 1	Paragraph	EISI Support or Oppose	EISI Decision Requested	EISI Reason provided for in submission	Section 42A Officer Recommendation	EISI Comments on Officer Recommendation
							<p>significant phases of on-farm development which do not necessarily require major shifts in land use type but will none-the-less impact on the calculation of the baseline – either on a rolling average, set average between 2009 and 2013, or the highest rate of that period. Such changes come in the form of:</p> <ul style="list-style-type: none"> • Change in irrigation system e.g, hard hose gun to pivot; • Change in crops grown due to ever changing international and local markets. This happens yearly and can be determined by weather events either in NZ or internationally i.e. drought in Australia, USA, UK, Russia and Ukraine; • Shift between livestock and cropping proportions on farm due to economic trends; • Change in farming systems other than irrigation i.e. tillage; • Weather events i.e. wetter winters/drier summers, dry winter/wet summer etc. <p>All of these events will significantly change what level of nutrients are being lost from an operation.</p> <p>2. The use of a baseline until 2017 creates an inequity between land uses/users. This is because those that are performing well but slightly above the 15kg/N/ha limit will have restrictions placed on their ability to change their land use or sell it, while others that are performing at much higher rates of N loss will be less restricted by virtue of their current higher leaching practice.</p> <p>3. <u>What are the risks of not having a baseline mechanism in the rules?</u> The Society considers that by removing the reference to the baseline during the period to 2017</p>

Section of Variation 1	Page of Variation 1	Paragraph	EISI Support or Oppose	EISI Decision Requested	EISI Reason provided for in submission	Section 42A Officer Recommendation	EISI Comments on Officer Recommendation
		<i>Cultivation</i>	Oppose	Delete this definition and make any consequential amendments.	There is no need for this definition as there are no policies or rules relating to cultivation. These matters were already submitted on and heard during the PCLWRP hearings and as a result were removed from that plan based on the evidence of a variety of submitters. It is inappropriate to 're-insert' these provisions again here in this plan when they have so recently been decided on appropriately.	Officer recommends deletion.	<p>will not open up any further risk to the environment. This is because the Council is potentially unlikely to enforce these rules until the Variation is made operative. This is likely to be during 2015 if there are no appeals. If there are appeals, similar to what has happened to the PLWRP then this operative date may be pushed out to 2016. On this timeframe that would only leave one year for the baseline mechanism to be soundly enforced which may not result in any real identifiable improvements to the environment before other post 2017 rules apply.</p> <p>Support Officer recommendation regarding deletion and Society makes further comment regarding 'cultivation' later in this statement in relation to Schedule 24.</p>
Section 4 – Amendments to Section 11 – Selwyn- Waihora, 11.4.1-11.4.5 Policies							
Policies 11.4.1 to 11.4.4	4-5 and 4-6	Policies 11.4.1 to 11.4.4	Oppose in part	Reduction in the area of the Cultural Landscape/Values Management Area to be within 10m of Te Waihora/Lake Ellesmere lake edge and Coopers Lagoon.	Large areas of land have been included in the Cultural Landscape/Values Management Area. Rules and policies associated with this area will substantially hinder farming operations in these areas. The Society acknowledges and appreciates that these values are important to recognise and provide for but that the extent of the proposed CLVM area is of concern.	<p>No reference or commentary has been provided in relation to Policy 11.4.1 by the Officer.</p> <p>No changes are recommended to Policies 11.4.2, 11.4.3 or 11.4.4.</p>	<p>Insufficient weighting of the submissions has been given to those supporting these provisions. Decisions made on submissions under the Resource Management Act do not rely on the numbers of supporting submissions and the number opposing. They rely on a careful and dutiful consideration of the matters and whether they meet the various provisions of the Act, least of which Section 5 which allows for the sustainable management which enables people and communities to provide for their social, economic, and cultural well-being and for their health and safety. By virtue of this section of the Act it requires careful consideration to be given to all those parties submitting but more importantly all those parties affected by the proposed provisions. The Society considers it</p>

Section of Variation 1	Page of Variation 1	Paragraph	EISI Support or Oppose	EISI Decision Requested	EISI Reason provided for in submission	Section 42A Officer Recommendation	EISI Comments on Officer Recommendation
Policy 11.4.5	4-6	Policy 11.4.5	Support and amend	<p>Amend final wording at end of policy as follows:</p> <p>“Recognise and protect the Waikewai Creek and Taumutu Creek as wahi tapu and prohibit the abstraction of surface water or groundwater takes with a direct or high stream depletion effect on Waikewai Creek or Taumutu Creek from 1 July 2025 when existing consents expire.”</p>	Te Taumutu Runanga and the Ellesmere Irrigation Society have agreed through negotiation with CRC representatives on a joint position in relation to the Waikewai and Taumutu Creeks. The policy reflects these negotiations, however it needs further amendment to recognise the agreed timeframe.	<p>Amend Policy 11.4.5 to read: <i>11.4.5 Recognise and protect the <u>wāhi tapu values associated with the Waikewai waterway by prohibiting Waikewai Creek and Taumutu Creek as wāhi tapu and prohibit* any new and phase out existing the abstraction of surface water or groundwater takes with a direct or high stream depletion effect on Waikewai Creek or Taumutu Creek, such that all existing abstraction ceases no later than 1 July 2025.</u></i></p> <p>* Note: the typographical error is taken directly as provided in the Officer report where ‘prohibiting’ and ‘prohibit’ are read directly adjoining one another.</p>	<p>entirely appropriate that the Variation provisions be amended as per the Society’s submission. This matter is further dealt with in Section 4 of this statement.</p> <p>The Officer has incorrectly recommended using wording at the end of policy which he suggests comes from the EISI submission. This wording is directly opposite to what is requested by the Society and therefore is not appropriate for insertion via its submission. The Joint Position Statement agreed to by the Society and Te Taumutu Runanga specifically states that amendments to these consents will only occur after 1 July 2025 and when the existing consents expire.</p> <p>The following wording is contained in the ZIP Addendum and comes directly from the agreed Joint Position Statement:</p> <p>“Recommendation 2.10 <i>The Sub-regional Section will:</i> <i>a) Recognise Waikewai as wāhi tapu by prohibiting, on expiry, surface and groundwater takes that have a hydraulic connection with a direct stream depletion effect or high stream depletion effect greater than 5 L/s;</i> <i>b) Enable existing consent holders to more easily move from surface water and stream depleting groundwater to a deeper non-stream depleting groundwater source.”</i></p> <p>Given the above there was clear guidance provided through the negotiations with Te Taumutu Runanga as to what this policy was to contain and this was recognised in the ZIP Addendum. Therefore the Society stands by the changes requested in its submission.</p>
Section 4 – Amendments to Section 11 – Selwyn- Waihora, Managing Land Use to Improve Water Quality Policies							
Policy 11.4.6	4-6	Policy 11.4.6	Oppose	<p>Amend wording of policy to read as:</p> <p>“Reduce Limit the total nitrogen load</p>	The limit set in Table 11(i) has been modelled on information that is yet to be obtained from the activities	No recommendation provided.	With respect, the Society is disappointed that no recommendation has been made in relation to these

Section of Variation 1	Page of Variation 1	Paragraph	EISI Support or Oppose	EISI Decision Requested	EISI Reason provided for in submission	Section 42A Officer Recommendation	EISI Comments on Officer Recommendation
Policy 11.4.12	4-6	Policy 11.4.12	Oppose	<p>entering Te Waihora/Lake Ellesmere by restricting minimising the losses of nitrogen from farming activities, industrial and trade processes and community sewerage systems, in accordance with the target (the limit to be met over time) and limits in Table 11(i)."</p> <p>Amend wording of policy to read as:</p> <p>"Reduce discharges of nitrogen, phosphorus, sediment and microbial contaminants from farming activities in the catchment by requiring farming activities to:</p> <p>(a) Not exceed the nitrogen baseline where a property's nitrogen loss calculation is more than 15 of 20kg of nitrogen per hectare per annum; and</p> <p>(b) Implement the practices set out in Schedule 24; and,</p> <p>(c) Implement a Farm Environment Plan prepared in accordance with Schedule 7 Part A, from 1 July 2015, when a property is greater than 10 hectares and is within the Lake Area in the Cultural Landscape/Values Management Area; and</p> <p>(d) Exclude stock from drains, in addition to the regional requirements to exclude stock from lakes, rivers and wetlands.</p>	<p>operating in the sub zone. This is the same scenario/philosophy that CRC worked with in setting water allocation limits in the Rakaia Selwyn Groundwater Zone prior to using information gained from actual groundwater use metering.</p> <p>It is considered that the provisions of the Variation will protect the tangata whenua values sufficiently without the need to further impose the requirement for Farm Environment Plans where farms are already meeting all the other provisions of the Variation. It is usual practice for consent applications for all activities that are regulated by CRC to be sighted and considered by the relevant runanga and/or Ngai Tahu. This is an appropriate practice but the Society considers that this does not need to be further stated in specific policy and rules of this Variation. A 20kg/N/ha is a more appropriate limit.</p> <p>It is also inappropriate to require the exclusion of all stock types from drains. In practice this would require the fencing off of all drains which would then negate the ability to clean drains, therefore causing an increased level of environmental damage. Such a provision was previously submitted on and heard at the PCLWRP hearings and taken out of that Plan because of the impractical nature of such provisions.</p>	No recommendation provided.	<p>policies. The Society therefore stands by its reasoning for submitting on these provisions.</p> <p>See comments above.</p>
Policy 11.4.13	4-6 and 4-7	Policy 11.4.13	Oppose	<p>Amend wording of policy to read as:</p> <p>"From 1 January 2017, further reduce discharges of nitrogen, phosphorus, sediment and microbial contaminants from farming activities in the catchment by requiring farming activities to:</p> <p>(a) Implement a Farm Environment Plan prepared in accordance with Schedule 7 Part A, where a property is greater than 50 hectares; and</p>	<p>The Society considers it inappropriate to have policies that relate to a baseline that pre-dates the plan from a legal perspective. It also unduly stifles future land development that may also operate under best practice and 20kg/ha nitrogen loss.</p>	No recommendation provided.	See comments above.

Section of Variation 1	Page of Variation 1	Paragraph	EISI Support or Oppose	EISI Decision Requested	EISI Reason provided for in submission	Section 42A Officer Recommendation	EISI Comments on Officer Recommendation
Policy 11.4.14	4-7	Policy 11.4.14	Support in part	<p>(b) Where a property's nitrogen loss calculation is greater than 1520kg of nitrogen per hectare per annum, meet the Good Management Practice Nitrogen and Phosphorus Loss Rates for the property's baseline land use.</p> <p>From 1 January 2022, to achieve the water quality limits in Section 11.7.3 require farming activities to:</p> <p>(a) Implement a Farm Environment Plan prepared in accordance with Schedule 7 Part A, where a property is greater than 20 hectares; and</p> <p>(b) Where a property's nitrogen loss calculation is greater than 1520kg of nitrogen per hectare per annum, make the following further percentage reduction in nitrogen loss rates, beyond those set out in Policy 11.4.13(b), to achieve the catchment target for farming activities in Table 11(i):</p> <p>(i) 30% for dairy (ii) 22% for dairy support; or (iii) 20% for pigs; or (iv) 13% for irrigated sheep, beef or deer; or (v) 10% for dryland sheep and beef; or (vi) 7% for arable; or (vii) 5% for fruit, viticulture or vegetables; or (viii) 0% for any other land use.</p>	<p>20kg/N/ha is a more appropriate limit.</p> <p>The support is the non-reference to baseline parameters in this policy.</p> <p>20kg/N/ha is a more appropriate limit.</p>	No recommendation provided.	See comments above.
Section 4 – Amendments to Section 11 – Lake, Catchment and Flow Restoration Policies							
Policies 11.4.18 to 20	4-7	Policies 11.4.18 to 20	Support in part	Retain existing wording.	The Society fully supports the restoration of Lake environments and associated waterways but has concerns about the rules that follow on from these policies. Farmers in the Ellesmere area have for some considerable time worked closely with CRC in restoration projects and funded them appropriately. To our knowledge this partnership has worked well with high success. The farmers in this area also want to look after and protect the streams as they are of heritage value to	Officer recommends retaining existing wording of policies 11.4.18 and 11.4.19.	The Society supports these recommendations.

Section of Variation 1	Page of Variation 1	Paragraph	EISI Support or Oppose	EISI Decision Requested	EISI Reason provided for in submission	Section 42A Officer Recommendation	EISI Comments on Officer Recommendation
					them as well. This partnership programme, for example the Harts Creek Stream care Group, works far better than the enforced regulatory model.	Officer has recommended new wording for policy 11.4.20.	Society supports proposed new wording.
Section 4 – Amendments to Section 11 – Sustainable Use of Water and Improved Flows Policies							
Policy 11.4.21	4-8	Policy 11.4.21	Oppose	Amend wording of policy as follows: “Manage groundwater and surface water together as a single resource , to ensure, in combination with the introduction of alpine water into the catchment, flows in the Waikirikiri/Selwyn River and lowland streams are improved and the allocation limits in Table 11(e) are met.”	Providing for a combined groundwater/surface water annual allocation limit does not reflect proper management of the two resources, their interactions, or their dynamic nature. Change policy 11.4.21 to reflect appropriate management regime for groundwater based on a generalised annual allocation that, when exceeded, requires detailed groundwater investigations to support further allocation. Delete the notion of a combined limit for groundwater and surface water. It would be inappropriate to try and run this varied catchment with surface and groundwater as a single resource and there is nothing to be gained from it.	Officer recommends additional wording which inserts the words ‘and targets after the word ‘limits’ to the policy.	The Society retains its reasoning as provided for in the submission.
Policy 11.4.22	4-8	Policy 11.4.22	Support	Support wording.	This policy will address concerns where trading of water from lowland areas to inland areas may result in increased adverse effects on stream flows.	Officer recommends changes to the wording.	The Society does not support the removal of clause (b) recommended by the Officer. Removing this clause will allow for ‘paper water’ to be used as ‘wet water’ in the upland area and will further increase the adverse effects on stream flows. This change to the wording will only exacerbate these adverse effects. A 50 % reduction in the transferred amount will not be a sufficient disincentive. Shifting the location of water allocation can make substantial changes to the environment both positively and negatively. In the instance of a number of water takes being transferred to the upper plains from the lower plains, this would give rise to increased stream depletion effects in reality but these would not be dealt with in this transfer process and would result in increased effects on the streams. Minor transfers between landholdings in the same ownership should also be allowed on a

Section of Variation 1	Page of Variation 1	Paragraph	EISI Support or Oppose	EISI Decision Requested	EISI Reason provided for in submission	Section 42A Officer Recommendation	EISI Comments on Officer Recommendation
Policy 11.4.23	4-8	Policy 11.4.23	Oppose	Delete policy and make consequential amendments.	Policy 11.4.23 requires allocation based on “demonstrated use”. This phrase is not defined. The existing phrase is “reasonable use” which is fully defined already, and for irrigation, reflects the water requirements to meet demand in a dry season which is the main reason for irrigating.	Officer recommends changing the policy wording to reflect reasonable use when calculated in accordance with Schedule 10 in order to meet demand conditions in 8.5 years out of 10 for a system with application efficiency of 80%.	temporary basis. The Officer recommendation is an improvement but the Society requests that the reference to 8.5 years needs to be changed to 9 years.
Policy 11.4.28	4-8	Policy 11.4.28	Oppose	Delete policy or alternatively amend wording as follows: “Protect the ecological and cultural health of the Waikirikiri/Selwyn River and lowland streams by including the minimum flow and partial restrictions in Tables 11(c) and 11(d) <u>(insert appropriate Table number)</u> on new and replacement resource consents from 2025 <u>where they have a proven direct or high stream depletion effect</u> ”.	Aquifer tests in the Ellesmere area have shown that only a minor number of wells have any noticeable effect on streams. It is estimated that unless wells are located within very close proximity i.e. less than 300m from a stream then they will have no significant effects on stream flows. Until such time as CRC does appropriate and actual aquifer testing to ensure true aquifer values are inserted in models used to assess stream depletion, then no rules or policies should be applied. This is a major area of work that has still not been undertaken. It is not appropriate to apply rules to users where there is as yet no proof that these effects actually exist to the extent that applies now. Policy 11.4.28 should also be amended to reference a single Table that contains a minimum flow and allocation regime for each river and/or stream if one applies (comprising a minimum flow, allocation restriction above the minimum flow, and allocation limit, all in flow rate, i.e. litres/second). The existing Tables 11(c), 11(d) and 11(g) should be combined and expanded to include the three components described for each river. This table should exclude reference to groundwater allocations that are not proven to be high or direct stream depleters.	Officer recommends removing reference to new and replacement consents and relating policy to all consents from 2025.	The Society stands by the proposed amendment in its submission and the reasons for it. The wording of the policy as it appeared in the Variation was based on the negotiations between the Society and Te Taumutu Runanga relating to the Waikekewai Stream. It was considered and agreed by these parties that to require the review of the consents before the expiry date was onerous on all parties involved and that given the minor level of actual connection to the streams, that it was reasonable to allow the consents to run their course before allowing their change in minimum flow limits/constraints. The investment in irrigation infrastructure alone is considerable based on the ability to use water as consented. It would take some considerable time to determine whether to change infrastructure and the type of irrigation used within the timeframes set when significant reliance is placed on the downstream effects of the CPW Scheme. The effects of this scheme may not be evident for some time and may only be coming to fruition near 2025. Therefore it would be inappropriate to review consents specifically then until such time as the consent holders were able to revise their farming operations. Large amounts of capital is involved in these changes and it would be inappropriate to enforce such change until the outcomes of the CPW scheme are seen.

Section of Variation 1	Page of Variation 1	Paragraph	EISI Support or Oppose	EISI Decision Requested	EISI Reason provided for in submission	Section 42A Officer Recommendation	EISI Comments on Officer Recommendation
Policy 11.4.29	4-8	Policy 11.4.29	Oppose	Delete policy or amend policy as follows: “Where the minimum flow and restriction regime in Table 11(c) will result in a significant loss of reliability, enable a staged <u>abstraction of water during the period that the relevant stream or waterbody is at or below the</u> minimum flow <u>level</u> , but only in circumstances where a consent applicant can demonstrate that they have had a high reliability of surface water supply for irrigation and/or prior to 22 February 2014, significant investment in infrastructure to take water has been made.”	There are several interpretations to this policy in its current form. For example it could aim to allow irrigation to occur in a staged manner when the stream has reached or gone below its minimum flow level. Alternatively, it could mean that a consent will have a condition with step increases in minimum flow over several years until it reaches the Table 11(c) flows. The policy needs to be re-worded to make it clear what the intention is.	Officer recommends deleting the policy.	The Society prefers the amendments stated in its submission as this would be in keeping with conditions on current consents that have been deemed by the CRC to have high or direct stream depleting effects.
Policy 11.4.30	4-8	Policy 11.4.30	Support	Enable existing resource consent holders to take groundwater where: (a) It will not have a direct or high stream depletion effect on a surface water body; and (b) An existing resource consent to take surface water or groundwater with a direct or high stream depletion effect greater than 5 L/s has been surrendered.	This is an appropriate policy to allow existing shallow wells to be replaced with deeper wells where a previous well may have had a proven direct or high stream depletion effect.	Officer recommends new wording.	The new wording proposed by the Officer will essentially achieve the same as the previously worded policy as it appeared in the Variation. However, the term ‘deep groundwater’ needs to be verified. Generally, and throughout various discussions over the years with hydrological staff at the CRC, a depth greater than 30m is considered ‘deep’ or below the level of the first aquifer at whatever depth that aquifer appears within the area of where the well is to be drilled.
New Policy (Te Taumutu Runanga)			Oppose via further submission.	No inclusion of this proposed policy.	The Society considers the proposed measures to be inappropriate given that a review of groundwater take consents in the Irwell area has just recently been undertaken and has imposed excessive restrictions on water users in this area. To undertake this process again would not return water to the Irwell River. This River’s changes in levels directly relate to the flows in the Selwyn River and the cumulative and upstream impacts on that system.	Officer recommends no new policy of this nature.	The Society agrees with the Officer recommendation and no regime should be implemented.
Section 4 – 11.5 Rules; On-site Wastewater, Offal and Farm Rubbish Pits, Stock Holding Areas and Animal Effluent, Silage Pits and Compost							
On-site Wastewater Rule 11.5.1 and Matter of Discretion 11.5.2 Offal and Farm Rubbish Pits Matter of Discretion 11.5.3	4-11	Rule 11.5.1 and Matter of Discretion 11.5.2 Matter of Discretion 11.5.3	Oppose	Delete these provisions or alternatively retain them and reduce the areas marked as ‘Cultural Landscape/Values Management Area’ to be 10m from the edge of Te Waihora/Lake Ellesmere and Coopers Lagoon only. And make any necessary consequential	Large areas of land have been included in the Cultural Landscape/Values Management Area. Rules and policies associated with this area will substantially hinder farming operations in these areas and potentially lead to significantly increased compliance	Officer recommends retaining provisions.	See comments in Section 4 attached.

Section of Variation 1	Page of Variation 1	Paragraph	EISI Support or Oppose	EISI Decision Requested	EISI Reason provided for in submission	Section 42A Officer Recommendation	EISI Comments on Officer Recommendation
Stock Holding Areas and Animal Effluent Matter of Discretion 11.5.4 Silage Pits and Compost Matter of Discretion 11.5.5		Matter of Discretion 11.5.4 Matter of Discretion 11.5.5.		amendments.	costs. The Society acknowledges and appreciates that these values are important to recognise and provide for but that the extent of the proposed CLVM area is of major concern.		
Section 4 – 11.5 Rules; Nutrient Management, Sediment and Microbial Contaminants							
Rule 11.5.7	4-12	Rule 11.5.7	Oppose	<p>Amend the rule as follows:</p> <p>“Until 1 January 2017 the use of land for a farming activity in the Selwyn Waihora catchment is a permitted activity provided the following conditions are met:</p> <p>1. The nitrogen loss calculation for the property does not exceed 1520 kg per hectare per annum; or</p> <p>2. The nitrogen loss calculation for the property is greater than 15 20kg per hectare per annum and the nitrogen loss calculation for the property or farm enterprise will not increase above the nitrogen baseline; and</p> <p>3. The Practices in Schedule 24 are being implemented and the information required is recorded in accordance with Schedule 24, and supplied to Canterbury Regional Council on request; and</p> <p>4. From 1 July 2015, for properties within the Lake Area in the Cultural Landscape/Values Management Area a Farm Environment Plan has been prepared and implemented in accordance with Schedule 7 Part A for all properties greater than 10 hectares.”</p> <p>Make any necessary consequential amendments.</p>	<p>Large areas of land have been included in the Cultural Landscape/Values Management Area. Rules and policies associated with this area will substantially hinder farming operations in these areas and potentially lead to significantly increased compliance costs. The Society acknowledges and appreciates that these values are important to recognise and provide for but that the extent of the proposed CLVM area is of concern.</p> <p>20kg/N/ha is a more appropriate limit.</p>	No recommendation provided.	<p>The Society considers now that there may be no need for a rule prior to 2017 given the timing of the hearing on Variation 1 and the likely release of its decision and the short amount of time it would apply to.</p> <p>The Society stands by its submission but would be in support of retaining 15kg N/ha/an limit.</p> <p>With respect to the rules relating to the Cultural Landscape/Values Management Area please refer to Section 4 of this statement for further information.</p>
Rule 11.5.8	4-12	Rule 11.5.8	Oppose	<p>Amend wording as follows:</p> <p>“From 1 January 2017, the use of land for a farming activity in the Selwyn Waihora catchment is a permitted activity, provided the following conditions are met:</p> <p>1. The nitrogen loss calculation for the property does not exceed 15 20kg per hectare per annum; and</p> <p>2. A Farm Environment Plan has been prepared and implemented in accordance</p>	<p>Large areas of land have been included in the Cultural Landscape/Values Management Area. Rules and policies associated with this area will substantially hinder farming operations in these areas and potentially lead to significantly increased compliance costs. The Society acknowledges and appreciates that these values are important to recognise and provide for but that the extent of the proposed CLVM area is of concern.</p>	No recommendation provided.	See above comments.

Section of Variation 1	Page of Variation 1	Paragraph	EISI Support or Oppose	EISI Decision Requested	EISI Reason provided for in submission	Section 42A Officer Recommendation	EISI Comments on Officer Recommendation
				<p>with Schedule 7 Part A for all properties greater than 10 hectares within the Lake Area in the Cultural Landscape/Values Management Area, and is supplied to Canterbury Regional Council on request; and</p> <p>3. A Farm Environment Plan has been prepared and implemented in accordance with Schedule 7 Part A for all properties greater than 50 hectares, and is supplied to Canterbury Regional Council on request;</p> <p>4. For properties less than 50 hectares but greater than 20 hectares:</p> <p>(a) Until 31 December 2021, the Practices in Schedule 24 are being implemented; and</p> <p>(b) From 1 January 2022, a Farm Environment Plan has been prepared and implemented in accordance with Schedule 7 Part A.”</p> <p>And make any consequential amendments necessary.</p>	20kg/N/ha is a more appropriate limit.		
Rule 11.5.9	4-12 and 4-13	Rule 11.5.9	Oppose	<p>Amend wording as follows:</p> <p>“From 1 January 2017, the use of land for a farming activity in the Selwyn Waihora catchment is a restricted discretionary activity, provided the following conditions are met:</p> <p>1. The nitrogen loss calculation for the property is greater than 15 20kg per hectare per annum; and</p> <p>A Farm Environment Plan has been prepared in accordance with Schedule 7 Part A; and</p> <p>3. The nitrogen loss calculation for the property has not increased above the nitrogen baseline.</p> <p>The exercise of discretion is restricted to the following matters:</p> <p>1. The quality of, compliance with the Farm Environment Plan; and</p> <p>2. The Good Management Practice Nitrogen and Phosphorus Loss Rates to be applied to the property in accordance with Policy 11.4.13(b); and</p> <p>3. The nitrogen loss rates to be applied to the property in accordance with Policy 11.4.14 (b), Policy 11.4.15 and Policy 11.4.16; and</p>	<p>The Society considers that there should be no reference to a nitrogen baseline because of its restricting abilities on land use change and development in the future. Also, the Society considers that it would not be legally appropriate to have reference to a baseline that relates to a period before the notification of any associated rules. The Society considers that it would be inappropriate to set nitrogen catchment limits in catchments when there is as yet no ‘actual physical’ data for the levels of loss in a catchment. This limit implementation in Table 11 (i) follows in the same way that CRC set water allocation limits in its plan prior to having any known metered amounts of water. It was this that led to the over allocation of water in this sub-region in the first place.</p> <p>20kg/N/ha is a more appropriate limit.</p>	No recommendation provided.	See above comments.

Section of Variation 1	Page of Variation 1	Paragraph	EISI Support or Oppose	EISI Decision Requested	EISI Reason provided for in submission	Section 42A Officer Recommendation	EISI Comments on Officer Recommendation
				<p>4. The nitrogen load target for farming activities in Table 11(i); and</p> <p>54. The potential benefits of the activity to the applicant, the community and the environment.”</p> <p>Make any consequential amendments.</p>			
Rule 11.5.10	4-13	Rule 11.5.10	Oppose	Delete this rule as it becomes redundant based on the proposed amendments above.	See above reasons.	Officer recommends no amendment.	The status’ provided under this rule are far too onerous, especially in relation to activities that have been established for many generations.
Rules 11.5.11 and 12	4-13	Rules 11.5.12	Oppose	<p>These rules should be amended and relocated to reflect that farms that do not have a Farm Environment Plan and are not permitted activities should be attributed a discretionary status. Those that are exceeding 1520kg nitrogen loss and do not have a Farm Environment Plan should be considered non-complying activities. Prohibited activity status should only be attributed to those farms losing more than 80kg per hectare per annum of nitrogen.</p> <p>And make any consequential amendments.</p>	It is inappropriate to apply a prohibited activity status to those activities that are well below an extensive nitrogen loss limit.	Officer recommends no amendment.	The status’ provided under this rule are far too onerous, especially in relation to activities that have been established for many generations.
Rule 11.5.13	4-14	Rule 11.5.13	Oppose	Amend the date in this rule to be 1 January 2025.	It is inappropriate to allow farms leaching more than 80 kg/N/ha to continue to do so until 2037. This period is beyond the life of this Plan and indicates that the regional authority is happy to allow such extensive leaching to carry on while other onerous restrictions are placed on other land users at 2025 or earlier.	Officer recommends no amendment.	The Society prefers an earlier date than 2037 for those leaching excessive amounts of nitrogen. This is because other more compliant users have been proposed to have significant restrictions put on them by 2025 when they are not likely to leach above the 15kg limit. However, a substantial time frame has been allowed for those leaching the most amounts, taking the most water and having the most adverse effect.
Section 4 – 11.5 Rules; Stock Exclusion and Drainage Water							
Rules 11.5.18, 19 and 20	4-14	Rules 11.5.18, 19 and 20	Oppose	Delete these rules and additional conditions. Make any consequential amendments.	These proposed changes serve to reinsert parts of rules that have already had decisions made on them via the PCLWRP hearings and Commissioners’ decision. There are basic practical reasons why it is inappropriate to have rules that exclude stock from artificial water courses. In practice this would require the fencing off of all drains which would then negate the ability to clean drains, therefore causing an increased level of environmental	<p>Officer recommends changes to wording of Rule 11.5.18 to allow for the non-fencing or stock exclusion from ephemeral drains or watercourses.</p> <p>Officer recommends no changes to Rules 11.5.19 and 11.5.20.</p>	<p>Officer recommendation to rule 11.5.18 is an improvement on the previous Variation wording. However there are practical inhibitions which make these rules still impractical to apply. See extended comments in Section 4 of this statement.</p> <p>The Society still requests the deletion of Rules 11.5.19 and 11.5.20. See extended comments in Section 4 of this statement.</p>

Section of Variation 1	Page of Variation 1	Paragraph	EISI Support or Oppose	EISI Decision Requested	EISI Reason provided for in submission	Section 42A Officer Recommendation	EISI Comments on Officer Recommendation
Additional Condition 11.5.21	4-14	Additional Condition 11.5.21	Oppose	Delete this additional condition.	<p>damage. Drains are designed to specifically only carry water during periods of high rainfall. The rule already contained in the PCLWRP is sufficient.</p> <p>The conditions already contained within the relevant Regional Rule 5.77 will ensure environmental standards are met and protected.</p>	Officer recommends deleting rule and inserting new provision in Schedule 7.	The Society supports the deletion of this rule only.
Section 4 – 11.5 Rules; Stormwater							
Additional Conditions 11.5.27 and 28	4-16	Additional Conditions 11.5.27 and 28	Oppose	Delete these additional conditions.	<p>Large areas of land have been included in the Cultural Landscape/Values Management Area. Rules and policies associated with this area will substantially hinder farming and other operations in these areas and potentially lead to significantly increased compliance costs. The Society acknowledges and appreciates that these values are important to recognise and provide for but that the extent of the proposed CLVM area is of concern.</p>	Officer recommends retaining Condition 11.5.27 without amendment and deleting Condition 11.5.28.	<p>The Society stands by its submission in relation to Condition 11.2.27. See extended comments in Section 4 of this statement.</p> <p>The Society agrees with the Officer recommendation to delete condition 11.5.28.</p>
Section 4 – 11.5 Rules; Taking and Use Surface Water and Take and Use Groundwater							
Rule 11.5.32	4-16 and 17	Rule 11.5.32	Oppose	<p>Delete rule or amend wording of rule as follows:</p> <p>“The taking and use of surface water from a river, lake or wetland or groundwater within the Selwyn Waihora catchment and including all areas within the Little Rakaia Combined Surface and Groundwater Allocation Zone is a restricted discretionary activity, provided the following conditions are met:</p> <p>1. The take in addition to all existing resource consented takes, does not result in any exceedance of any of the allocation limits in Table 11(e), 11(f), and 11(g) and <u>(new Table for surface water environmental flow and allocation regime)</u>; or</p> <p>2. The proposed take is the replacement of a lawfully established surface water or groundwater take for which an</p>	<p>The Society considers it problematic to consider groundwater and surface water allocations within one limit. This is because:</p> <ul style="list-style-type: none"> • Aquifer testing in the Ellesmere area, and particularly in the Little Rakaia Zone, have shown that the majority of wells are not stream depleting beyond the 5 L/s threshold; • Stream depleting takes have been inappropriately based on modelled data from CRC that does not reflect the reality in this area; • The surface water allocation has wrongly been calculated on direct, high and medium stream depletion connections 	Officer recommends minor changes to wording and includes another matter of discretion to consider in relation to adverse effects on mahinga kai, wahi tapu or wahi taonga with the Cultural Landscape/Values Management Area.	The Society opposes the Officer recommendations and the Society relies on the same request and reasons for the request for the amendment of the Rule as set out in the submission. See extended comments in Section 4 of this statement.

Section of Variation 1	Page of Variation 1	Paragraph	EISI Support or Oppose	EISI Decision Requested	EISI Reason provided for in submission	Section 42A Officer Recommendation	EISI Comments on Officer Recommendation
				<p>application to continue the activity has been made under s124 of the RMA and there is no increase in the proposed rate of take or annual volume; and</p> <p>3. A surface water or a groundwater take with a direct or high degree of stream depletion effect greater than 5 L/s determined in accordance with Schedule 9 <u>and based on aquifer testing done in the proximity of the proposed take,</u> complies with the minimum flow and restriction regime in Tables 11(c) and 11(d); and</p> <p>4. A groundwater take within the West Melton Special Zone as shown on the Planning Maps complies with the level restrictions in Table 11(h); and</p> <p>5. Unless it is associated with the artificial opening of a hāpua, lagoon or coastal lake to the sea, the take is not from a wetland or hāpua; and</p> <p>6. For the renewal of an existing irrigation take the annual volume and maximum rate of take has been calculated in accordance with method 1 in Schedule 10; and</p> <p>7. The take is not a surface water or groundwater take with a direct or high degree of stream depletion effect greater than 5 L/s, determined in accordance with Schedule 9 <u>and based on aquifer testing done in the proximity of the proposed take</u>, within the Waikekewai Creek and Taumutu Creek catchments; and</p> <p>8. The bore interference effects are acceptable, as determined in accordance with Schedule 12 <u>and based on aquifer testing done in the proximity of the proposed take;</u></p> <p>The exercise of discretion is restricted to the following matters:</p> <p>1. The rate, volume and timing of the water take; and</p> <p>2. For new resource consent applications that are not a renewal of an existing consent, whether the amount of water to be taken and used is reasonable for the proposed use. In assessing reasonable use for irrigation purposes, the CRC will consider the matters set out in Schedule 10; and</p> <p>3. The availability and practicality of using</p>	<p>when the rules in the PCLWRP only require direct and high takes to have minimum flow conditions;</p> <ul style="list-style-type: none"> • Flows in the streams are affected by all users not just those immediately adjacent to them – so to only have an allocation relevant to surface water users and actual proven stream depletion groundwater takes does not address the impact of cumulative effects; • Table 11(e) therefore is incorrect. • Schedule 9 needs amending to recognise the use of nearby aquifer testing data relating to stream depletion in the area relevant to the proposed take; • Table 11(c) is inappropriate and needs amending as the proposed minimum flow levels will have a major impact on the viability of some farms; • There is no real issue in separating out the surface water allocation from the groundwater one and having separate allocation rules. <p>The methods set out in Schedule 10 allow an applicant to choose an appropriate method so there should be no restriction as to which method is applied.</p>		

Section of Variation 1	Page of Variation 1	Paragraph	EISI Support or Oppose	EISI Decision Requested	EISI Reason provided for in submission	Section 42A Officer Recommendation	EISI Comments on Officer Recommendation
				<p>alternative supplies of water; and</p> <p>4. The application efficiency where water is to be taken and used for irrigation; and</p> <p>5. The proximity and actual or potential adverse environmental effects of water use on any significant indigenous biodiversity and adjacent dryland habitat; and</p> <p>6. For a surface water takes:</p> <p>(i) The effects the take has on any other authorised takes or diversions; and</p> <p>(ii) Whether and how fish are prevented from entering the water intake; and</p> <p>(iii) The provisions of any relevant Water Conservation Order; and</p> <p>7 For groundwater takes:</p> <p>(i) The maximum rate of take, including the capacity of the bore or bore field to achieve that rate, and the rate required to service any irrigation system; and</p> <p>(ii) the actual or potential adverse environmental effects the take has on any other authorised takes, including interference effects as set out in Schedule 12 and based on aquifer testing done in the proximity of the proposed take; and</p> <p>(iii) whether salt-water intrusion into the aquifer or landward movement of the salt water/fresh water interface is prevented; and</p> <p>(iv) the protection of groundwater sources, including prevention of backflow of water and contaminants; and</p> <p>(v) the appropriateness of applying adaptive management conditions.</p> <p>And make any consequential amendments including insertion of new surface water take rule using wording from above.</p>	This part could be separated out into surface water take rule/s.		
Rule 11.5.33	4-17 and 18	Rule 11.5.33	Support in part	<p>Amend rule as follows:</p> <p>“Despite Rule 11.5.32 the taking and use of groundwater within the Selwyn Waihora catchment and including all areas within the Little Rakaia Combined Surface and Groundwater Allocation Zone is a restricted discretionary activity provided the following conditions are met:</p> <p>1. The applicant holds a resource consent</p>	The Society supports the intention of this rule but considers again that the surface water and groundwater allocation components should be dealt with using separate tables to identify their own specific allocation amounts and for the reasons also set out above.	Officer recommends minor changes to wording and includes another matter of discretion to consider in relation to adverse effects on mahinga kai, wahi tapu or wahi taonga with the Cultural Landscape/Values Management Area.	The Society supports in part the Officer recommendation but the Society relies on the same request and reasons for the request for the amendment of the Rule as set out in the submission. The Society opposes the introduction of a new matter of discretion relating to the Cultural Landscape/Values Management Area. See extended comments in Section 4 of this statement.

Section of Variation 1	Page of Variation 1	Paragraph	EISI Support or Oppose	EISI Decision Requested	EISI Reason provided for in submission	Section 42A Officer Recommendation	EISI Comments on Officer Recommendation
				<p>to take and use surface water or groundwater with a direct or high stream depletion effect greater than 5 L/s; and</p> <p>2. The existing resource consent referred to in condition 1 is surrendered; and</p> <p>3. The groundwater take will be abstracted from the same property as the existing resource consent and there is no increase in the proposed rate of take or annual volume; and</p> <p>4. If the abstraction is from an up-plains location, it is below 50 m deep; or</p> <p>5. If the abstraction is from a down-plains location, it is below 30 m deep or from the second confined aquifer; and</p> <p>6. For an irrigation take the annual volume and maximum rate of take sought has been calculated in accordance with Method 1 in Schedule 10; and</p> <p>7. The bore interference effects are acceptable, as determined in accordance with Schedule 12 <u>and based on aquifer testing done in the proximity of the proposed take.</u></p> <p><i>The exercise of discretion is restricted to the following matters:</i></p> <p>1. The maximum rate of take, including the capacity of the bore or bore field to achieve that rate, and the rate required to service any irrigation system; and</p> <p>2. Whether the amount of water to be taken and used is reasonable for the proposed use assessed in accordance with method 1 in Schedule 10; and</p> <p>3. The effects the take has on any other authorised abstraction, including interference effects as indicated by a Step Test undertaken in accordance with the requirements of Schedule 11 and well interference calculated in accordance with the method in Schedule 12 <u>being based on aquifer testing done in the proximity of the proposed take;</u> and</p> <p>4. Where the take is less than 2 km from the coast, whether salt-water intrusion into the aquifer or landward movement of the salt water/fresh water interface is prevented; and</p> <p>5. The protection of groundwater sources, including the prevention of backflow of water or contaminants.</p>	<p>The methods set out in Schedule 10 allow an applicant to choose an appropriate method so there should be no restriction as to which method is applied.</p>		

Section of Variation 1	Page of Variation 1	Paragraph	EISI Support or Oppose	EISI Decision Requested	EISI Reason provided for in submission	Section 42A Officer Recommendation	EISI Comments on Officer Recommendation
Rules 11.5.34, 35 and 36	4-19	Rules 11.5.34, 35 and 36	Support in part	<p>Amend rules as follows:</p> <p>“11.5.34 Despite Rule 11.5.32 the taking and use of surface water or groundwater for the sole purpose of augmenting groundwater or surface water to increase stream flows in the Selwyn Waihora catchment and including all areas within the Little Rakaia Combined Surface and Groundwater Allocation Zones is a discretionary activity.</p> <p>11.5.35 The taking and use of surface water from a river, lake or wetland or groundwater within the Selwyn Waihora catchment and including all areas within the Little Rakaia Combined Surface and Groundwater Allocation Zones that does not meet Conditions 3, 4, 5 or 8 in Rule 11.5.32 is a non-complying activity.</p> <p>11.5.36 The taking and use of surface water from a river, lake or wetland or groundwater within the Selwyn Waihora catchment and including all areas within the Little Rakaia Combined Surface and Groundwater Allocation Zones that does not meet Conditions 1, 2, 6 or 7 of Rule 11.5.32 or Rule 11.5.33 or Rule 11.5.34 is a prohibited non-complying activity.</p>	The rules need to reflect that the Surface water and Groundwater allocations are separate as recommended above. In addition and for the reasons stated above, the status of the activity relating to Rule 11.5.36 should be no stricter than ‘non-complying’.	Officer recommends minor changes to wording.	The Society prefers the wording as proposed by the Society in its submission.
Section 4 – 11.5 Rules; Transfer of Water Permits							
Rule 11.5.37	4-19	Rule 11.5.37	Support in part	<p>Amend rule and associated maps to ensure up-plains area and down-plains area is shown:</p> <p>“The temporary or permanent transfer, in whole or in part, (other than to the new owner of the same property site to which the take and use of water relates and where the location of the take and use of water does not change) of a water permit to take or use surface water or groundwater within the Selwyn Waihora catchment, is a restricted discretionary activity, provided the following conditions are met:</p> <p>1. The reliability of supply for any other lawfully established water take is not reduced; and</p> <p>2. In the case of surface water, the point of take remains within the same surface</p>	The rule need to reflect that the Surface water and Groundwater allocations are separate as recommended above.	The Officer recommends minor changes and the removal of clause 3. (c).	The Society does not support the removal of clause (c). By removing this clause will allow for ‘paper water’ to be used as ‘wet water’ in the upland area and will further increase the adverse effects on stream flows. This change to the wording will only exacerbate these adverse effects. A 50% reduction in the transferred amount will not be a sufficient disincentive. Shifting the location of water allocation can make substantial changes to the environment both positively and negatively. In the instance of a number of water takes being transferred to upper plains from the lower plains, this would give rise to increased stream depletion effects in reality but these would not be dealt with in this transfer process and would result in increased effects on the

Section of Variation 1	Page of Variation 1	Paragraph	EISI Support or Oppose	EISI Decision Requested	EISI Reason provided for in submission	Section 42A Officer Recommendation	EISI Comments on Officer Recommendation
				<p>water catchment and the take complies with the minimum flow and restriction regime in Tables 11(c) and 11(d); or</p> <p>3. In the case of groundwater:</p> <p>(a) the point of take is within the same groundwater allocation zone or combined surface and <u>or</u> groundwater allocation zone; and</p> <p>(b) the bore interference effects as set out in Schedule 12 are acceptable; and</p> <p>(c) the transfer is not from down-plains to up-plains; and</p> <p>(d) the transfer is not from a person who holds shares in an Irrigation Scheme in the Irrigation Scheme Area as shown on the Planning Maps; and</p> <p>(e) In addition for stream depleting groundwater takes:</p> <p>(i) the transfer is within the same surface water catchment; and</p> <p>(ii) the take complies with the minimum flow and restriction regime in Table 11(c) and 11(d); and</p> <p>(iii) the stream depletion effect is no greater in the transferred location than in the original location <u>if it is has a depletion effect of more than 5 L/s</u>; and</p> <p>4 If the transfer is within the Rakaia-Selwyn or Selwyn-Waimakariri Combined Surface and <u>or</u> Groundwater Allocation Zones 50% of the volume of transferred water is to be surrendered.</p> <p><i>The exercise of discretion is restricted to the following matters:</i></p> <p>1. The nature of the transfer, whether short term, long term, partial or full, and the apportioning of the maximum rate of take and annual volume in the case of a partial transfer; and</p> <p>2. The appropriateness of conditions, including conditions on minimum flow, annual volume and other restrictions to mitigate effects; and</p> <p>3. The reasonable need for the quantities of water sought, the intended use of the water and the ability of the applicant to abstract and use those quantities; and</p> <p>4. The efficiency of the exercise of the resource consent; and</p> <p>5. The reduction in the rate of take in times of low flow; and</p> <p>6. The method of preventing fish from</p>	<p>This wording needs to be amended to refer to an amended table/s that refer to surface water allocation only.</p>		<p>streams. Minor transfers between landholdings in the same ownership should also be allowed on a temporary basis.</p>

Section of Variation 1	Page of Variation 1	Paragraph	EISI Support or Oppose	EISI Decision Requested	EISI Reason provided for in submission	Section 42A Officer Recommendation	EISI Comments on Officer Recommendation
Rule 11.5.39	4-20	Rule 11.5.39	Oppose	entering any water intake. And make any consequential amendments. Amend status of rule to 'non-complying' and delete reference to 'prohibited'.	There will be parts of the relevant rules that some activities may not be able to meet but that do not cause any significant adverse effects on the environment. Therefore a reduced status of 'non-complying' activity is considered more appropriate.	Officer recommends minor wording changes.	The Society maintains its position in relation to its submission and the reasons for it.
Section 4 – 11.5 Rules; Augmenting Groundwater or Surface Water							
Rules 11.5.40 and 41	4-20 and 21	Rules 11.5.40 and 41	Support	Retain existing wording.	Augmentation may assist improved lowland streams flows in the future but care needs to be taken should this occur in order to minimise any adverse effect on raising groundwater levels, particularly in the lower down plains area.	Officer recommends minor wording changes and recommends the insertion of further conditions or part conditions recognising that the purpose of the augmentation is for the restoration of flows for ecological and cultural benefit.	The Society maintains its position in relation to its submission and the reasons for it.
Section 11.6 Fresh Water Outcomes							
Table 11(a): Freshwater Outcomes for Selwyn Waihora Catchment Rivers	4-27, 28 and 29	Table 11(a)	Oppose	Delete Table. In particular remove 'Doyleston Drain', 'Hanmer Road Drain' and reference to 'other lowland spring-fed streams'. Remove reference to these drains and streams in the Key.	It is inappropriate to have subjective references in this table. Where there are no numerical numbers available there should be no reference to indicators of this type i.e. Cultural indicators. In addition, there is no real lengthy data on the values relating to Spring fed and lowland plains streams and rivers. Therefore the values in the table should apply only to those rivers that have been monitored for some significant time and that are identified main rivers. 'Doyleston Drain' and 'Hanmer Road Drain' are drains and should be removed from reference as they are predominantly dry. They were built for drainage of high water table water and do not serve to retain fauna or flora. The reference to 'other lowland spring-fed streams' should be removed as this term is too non-specific and inappropriate to regulate	Officer recommends no change.	EISI retains the reasoning provided in the submission.

Section of Variation 1	Page of Variation 1	Paragraph	EISI Support or Oppose	EISI Decision Requested	EISI Reason provided for in submission	Section 42A Officer Recommendation	EISI Comments on Officer Recommendation
			Oppose	Delete all references to: Hanmer Road Drain and the row relating to it; Unnamed Drain at Prendergast property – tributary of Irwell River and the row relating to it;	These entities were developed specifically to go dry as they are drains and were not intended to be life supporting mechanisms.	Officer recommends no changes.	See extended comments in Section 4 of this statement.
			Oppose	Delete all references to: Irwell River (at Leeston Christchurch Road) and the row relating to it; Selwyn River (at Rennie property D/S of intake and row relating to it; Tent Burn Stream and row relating to it. See also requested amendments below regarding reformatting of tables.	These references and the associated flow levels are inappropriate due to the impact such levels would have on the economic and social wellbeing of those parties who would be affected by minimum flow conditions on their groundwater take consents.	Officer recommends no changes.	See extended comments in Section 4 of this statement.
Rule 11.7.2 Groundwater and Surface Water Allocation Limits Table 11(e): Combined Surface Water and Groundwater Allocation Limits for Selwyn-Waimakariri, Rakaia-Selwyn, and Little Rakaia Combined Surface and Groundwater Allocation Zones Table 11(g): Surface Water Allocation Limits	4-33	Heading, wording and Table 11(e) and 11(g)	Oppose	Delete entire table and other related tables if necessary. The Tables should be re-formatted to contain separate regimes for surface waters and for groundwater. Table 11(c) and (d) and (g) should be amalgamated into one Table and expanded to provide the normal regime (minimum flow, restriction regime, allocation limit) for each stream separately. Tables 11(e) and (f) should be one Table covering allocation limits for each groundwater zone (not combined annual limits with surface waters). Delete the allocation limits set for all the allocation zones set in Table 11(e). Make any consequential amendments to these tables and associated tables as necessary.	Surface water and groundwater allocations should be kept separate. For all other allocation zones in the Variation they have been kept apart except for the Little Rakaia zone. All areas should be dealt with consistently and in a way that does not result in one area carrying the burden of over allocation of groundwater in an adjacent area. The allocation limits proposed have been based on inappropriate modelling and with insufficient consideration given to the economic and social impact.	Officer recommends no changes.	The Society retains the reasoning provided in the submission.
Rule 11.7.3 Water Quality Limits and Targets Table 11(i): Catchment Target and Limits for Nitrogen Losses from Farming Activities, Community Sewerage Systems and Industrial or Trade Processes	4-34	Table 11(i)	Oppose	Delete limits.	There is no way of knowing what an appropriate limit is when there is no data as yet held by the CRC based on the levels of nitrate loss per farm, industry or community facility or residential activity in this sub-region. Until such time as actual physical data on this is known then no limits can be	Officer recommends inconsequential changes.	EISI retains the reasoning provided in the submission.

Section of Variation 1	Page of Variation 1	Paragraph	EISI Support or Oppose	EISI Decision Requested	EISI Reason provided for in submission	Section 42A Officer Recommendation	EISI Comments on Officer Recommendation
Table 11(k): Limits for Rivers	4-35	Table 11(k)	Oppose	Amend point (2) below table to read as follows: “(2) Excluding Boggy Creek, and Doyleston Drain, Hanmer Road Drain and Unnamed Drain at Prendergast Property. ”	imposed. This is the very same problem that occurred with water allocation in the development of the NRRP, where limits were set without the knowledge of water metering records. These additional drains need to be added here as they were designed as drains which are predominantly dry during summer months because there is no water to drain then.	Officer recommends no changes.	EISI retains the reasoning provided in the submission. See related reasons in Section 4 of this statement.
Table 11(l): Limits for Lakes	4-35	Table 11(l)	Oppose	Delete Table.	Insufficient information available to provided appropriate limits for these lakes.	Officer recommends no changes.	EISI retains the reasoning provided in the submission.
11.8 Te Waihora Cultural Landscape/Values Management Area							
Table 11(n): Cultural Landscape/Values Management Area	4-36	Table 11(n)	Oppose	Reduce the size Te Waihora Cultural Landscape/Values Management Area of the Lake Area to be the land area 10 metres from the Lake Edge and the lagoon edge of Coopers Lagoon. Delete the following waterways from the River zone areas: Selwyn River; Waikekewai; Birdlings Brook; Te Raki; Waitatari/Harts Creek; Boggy Creek; Waiwhio/Irwell River. And make any consequential amendments.	The proposed areas are considerable and will impose major constraints on the land areas involved. It also proposes works to be done in these areas which would effectively retire land from their current use. The areas of land involved and the rules and actions associated with these areas are considerable and in effect require landowners to undertake major works on their land at their cost but for a major benefit of other parties. To date non-regulatory mechanisms have been used to redevelop and regenerate native areas on private land as joint projects between the CRC and streamcare groups such as the Harts Creek Streamcare Group. This has resulted in excellent outcomes and ones that all parties are proud to be associated with. Trying to achieve the same outcomes via regulation and enforcement may potentially prove unsuccessful. There are no maps indicating the location of the River zones or streams and the ones produced by the CRC to date still show incorrect locations for some of these streams. Because of this error in not providing River Zone maps people may not understand the impact of any rules on their property and	Officer recommends only deleting reference to river zone maps that were not notified during Variation 1 process.	EISI retains the reasoning provided in the submission. See extended comments in Section 4 of this statement. The Society also notes that it is not aware of a waterway entitled Te Raki. Where there is also an English name for this waterway it should be added to the text.

Section of Variation 1	Page of Variation 1	Paragraph	EISI Support or Oppose	EISI Decision Requested	EISI Reason provided for in submission	Section 42A Officer Recommendation	EISI Comments on Officer Recommendation
					therefore have not submitted. The Variation should be re-notified with an amended planning map/s showing the River zone areas.		
11.11 Schedules							
Schedule 7 – Farm Environment Plan	4-37 and 4-38	All	Oppose	Delete all proposed changes to Schedule 7. And make any consequential amendments.	It is inappropriate to require these additional matters based on the proposed location of the Lake and River zones and the limits proposed in the Variation.	Officer does not specify a recommendation.	EISI retains the reasoning provided in the submission. See extended comments in Section 4 of this statement.
Schedule 10 – Reasonable Use Test	4-38	All	Oppose	Delete all proposed changes to Schedule 10. And make any consequential amendments.	The reliability needed to retain appropriate economic and social wellbeing is when an irrigation demand is based on a nine years of the 10 limit. The Variation proposes to reduce this to 8.5 years out of 10. The reasons for further restricting the reasonable needs for water are not clear. The reason for undertaking irrigation is to mitigate against droughts. If the volume of water is restricted too much, it calls into question the expense of purchasing and operating irrigation equipment.	Officer does not recommend any changes.	EISI retains the reasoning provided in the submission.
Schedule 13 – Requirements for implementation of water allocation regimes	4-38	All	Oppose	Delete all proposed changes to Schedule 13. And make any consequential amendments.	It is inappropriate to combine surface water and groundwater into one combined allocation block, especially in relation to only one particular sub-zone. This creates an inequity across the region and wrongly attributes one area with compliance with water allocation limits that are physically affected by water takes beyond the boundary of that combined allocation zone.	Officer recommends minor changes.	EISI retains the reasoning provided in the submission and supports the evidence of Bowden Environmental Ltd with respect to separating out the surface water and groundwater allocation blocks.
5. Amendments to Section 16 - Schedules							
Schedule 24 – Farm Practices (c) Intensive winter grazing (d) Cultivation	5-1	(c) and (d)	Oppose	Delete paragraphs (c) and (d).	There are basic farming practice reasons why the proposed setbacks for intensive winter grazing and cultivation strips are entirely inappropriate. They would potentially also lead to an increased level of water quality degradation than is currently the Good Management practice approach taken by farmers e.g. vegetative strips may be difficult to maintain and could become a biosecurity threat.	Officer recommends minor changes.	The Society considers the wording changes are helpful but do not go far enough to alleviate the problems associated with requiring the proposed setbacks from watercourses. They are simply impractical from a day-to-day farming perspective. For instance, ephemeral drains should be excluded from having setbacks of vegetation. See extended comments in Section 4 of this statement.

Section of Variation 1	Page of Variation 1	Paragraph	EISI Support or Oppose	EISI Decision Requested	EISI Reason provided for in submission	Section 42A Officer Recommendation	EISI Comments on Officer Recommendation
Selwyn – Waihora Map Series							
All Maps	6-1 to 6-15	Maps SW-01 to SW-13	Oppose	Insert wording that indicates that these maps take preference over any other maps included in the plan and shall be the only maps that relate to the Selwyn – Waihora Sub-region area.	It is not clear from the Variation as to whether these maps are intended to be in addition to or instead of the maps already included in the PCLWP.	Officer recommends no changes.	
Maps SW-09, 10, 12 and 13	6-11, 12, 14 and 15	Maps SW-09, 10, 12 and 13	Oppose	Amend and reduce extent of Te Waihora Cultural Landscape/Values Management Area to be a distance of 10metres from the Te Waihora / Lake Ellesmere edge; and a distance of 10 metres from the Coopers Lagoon/Muriwai edge.	<p>The proposed areas are considerable and will impose major constraints on the land areas involved. It also proposes works to be done in these areas which would effectively retire land from their current use. The areas of land involved and the rules and actions associated with these areas are considerable and in effect require landowners to undertake major works on their land at their cost but for a major benefit of other parties.</p> <p>To date non-regulatory mechanisms have been used to redevelop and regenerate native areas on private land as joint projects between CRC and streamcare groups such as the Harts Creek Streamcare Group. This has resulted in excellent outcomes and ones that all parties are proud to be associated with. Trying to achieve the same outcomes via regulation and enforcement may potentially prove unsuccessful.</p>	Officer recommends no changes.	EISI retains the reasoning provided in the submission. See extended comments in Section 4 of this statement.
			Oppose	Remove/delete 'Phosphorus Sediment Risk Areas' from the maps.	Phosphorus loss from a property is best dealt with via each Farm Management Plan and does not need to be shown on maps in relation to only some properties. Also, it appears that these areas have been based particular on soil types rather than an appropriate investigation of any actual phosphorus risk areas. In the majority of cases near stream and drain edges the land is raised and prevents uncontrolled runoff entering waterways.		Relates to Farm Environment Plan changes in Schedule 7. See comments in Section 4 of this statement

4. FURTHER SUPPORTING INFORMATION IN RELATION TO SUBMISSIONS ON VARIATION 1 PROVISIONS

The following provides further supporting information regarding the submissions and comments provided in the table contained in Section 3 above.

4.1 ECOLOGICAL BACKGROUND

Lake Ellesmere / Te Waihora Nutrient Levels and Water Quality

- 4.1.1 The nutrient status of Lake Ellesmere/Te Waihora is generally unchallenged when it is described as hypereutrophic (Lineham 1983¹). However, the cause and trending of this condition is uncertain. There is no compelling evidence available to suggest that the current trophic state of the lake is any different to earlier times, or what has caused it.
- 4.1.2 Monitoring data began around 1965 and was not regular until 1983. Kitto (2010²) shows an absence in trends from 1965-2010 in Total Phosphate and Nitrate (data from Huges et al 1974³ and from CRC 2010). There is some suggestion in the data of an increase in total phosphates between 1970 to 1983, but that increase may be as much the variability of data collection as a change in the lake's condition.
- 4.1.3 Kitto, in summarising the condition of Lake Ellesmere/Te Waihora trends from 1993 to 2007, suggests that Total nitrogen has decreased (in some locations) or else not changed, that Dissolved Reactive Phosphorus (DRP) has been increasing (statistically significantly) at most locations, while Total phosphorus has not changed. The ratio of TN:TP has been decreasing (statistically significantly).
- 4.1.4 The DRP has also increased in many lake feeder tributaries (i.e. Halswell River, Hanmer Road Drain, Doyleston Drain, Boggy Creek, Irwell River). Some of which have riparian re-vegetated buffers or restoration/care programmes.
- 4.1.5 Comparison of lake water quality pre-1990s appears to show that nutrient concentrations may have been higher in the lake in the 1970s and 1980s compared to the past 10 years. This is likely to be the result cessation or improvement of direct discharges of treated sewage (e.g. Lincoln township) and piggery and dairy shed effluent to waterways. Unfortunately there is inadequate data to look at whether phytoplankton biomass was previously higher or not.

Brown Trout

- 4.1.6 Brown trout were introduced into the lake around 1868 and the population expanded and fish became very large. Through the 1920s to 1930 Lake Ellesmere / Te Waihora was reputedly one of the world's best trout fisheries (Hughey & Taylor 2009⁴). From the 1930's that fishery gradually declined and is now of relatively poor condition. This change may simply be a natural boom and bust event seen in other acclimatised species free from natural predation in New Zealand (e.g. the red deer populations around Nelson).

¹ Eutrophication of Lake Ellesmere: A Study of Phytoplankton : a Thesis , I. W. Lineham. University of Canterbury, 1983 - Ellesmere, Lake (N.Z.) - 335 pp.

² Kitto, S.G. (2010). The environmental history of Te Waihora – Lake Ellesmere. Unpubl. MSc thesis, University of Canterbury. 257 p.

³ Hughes, H.R.; McColl, R.H.S.; Rawlence, D.J. (1974). Lake Ellesmere. A review of the lake and its catchment. New Zealand Department of Scientific and Industrial Research. 27 p.

⁴ Hughey, K.F.D.; Taylor, K.J.W. (eds). 2009. Te Waihora/Lake Ellesmere: State of the lake and future management. EOS Ecoogy, Christchurch. 150 pp.

- 4.1.7 The ability of the lake to support that large early population has been attributed to its “natural” high productivity (associated with a macrophyte dominated clear water lake), large size, rich feeder tributaries and regular access to the ocean. In other words there was an abundance of food (native fishes and macro invertebrates) and a large space in which to sustain many large fish.
- 4.1.8 By 1940 an estimation was made by the Acclimatisation Society of 65,000 spawning brown trout, a proton of the total fishery which may have been as great as 200,000 adult fish. As a top predator in the system 200,000 adult trout (or roughly 200 tons of fish) would have consumed a significant amount of the standing biomass of native fish and invertebrates; perhaps enough to affect processes in the lake.
- 4.1.9 After the Wahine storm (1968) trout numbers dropped markedly (presumably related to the habitat damage, ongoing erosion and suspended sediment issues and as the lake tipped from macrophyte to algae dominated, but science has not determined the exact causes). Following that period, brown trout have continued to decline, without any good explanation as to why. Some explain this as a result of the absence of the old macrophyte beds (and all the functions they performed) and bycatch from commercial fisheries. It may simply be that the lake’s productivity for brown trout is no longer sufficient to sustain the extraordinary numbers it once did. The conditions and supporting resources were depleted by the large biomass of fishes, and, following habitat change related to the Wahine storm have never recovered.
- 4.1.10 As with game birds, the (still large) biomass of fish liberates and releases nutrients into the lake through defecation. As with resident birds this is not an introduction of nutrients but a process that changes the time and mode of nutrient “lock up” – trout, as with game birds, may keep nutrients in a faster cycle and make it more available more often than it would have otherwise been.
- 4.1.11 In terms of the native aquatic biodiversity in the lake and tributaries, large populations of brown trout are adverse to the native fish and macroinvertebrate species through predatory consumption (of large amounts) (McIntosh et al 2010⁵) and brown trout should not be a target or focus of lake condition “recovery” because they are a threat or pest to other species.

Game birds and nutrients

- 4.1.12 In addition to the various migratory and native species there are thousands of black swan, Canada geese and mallard ducks that seasonally inhabit the lake. These birds consume tonnes of algae and macrophyte and defecate in and on the edge of the waters every year. As with the Brown trout numbers throughout the years, these game bird populations have waxed and waned. Pre-1960 black swan were in very high abundance but declined rapidly in the 1960s and 70s (to now around 4000) and Canada geese numbers have fluctuated between 15000 and now a more regulated 6000. There are also a variable number of mallard. The Te Waihora Ellesmere Trust publishes bird counts. The data for 2013 records nearly 6000 Mallard, 6000 Canada geese and 8500 Black swan. In 2014 there were 7500 black swan, 3700 geese, and 5000 Mallard.
- 4.1.13 On average then there are around 18,000 game birds on the lake. Most countries with swan and Canada geese report and manage health issues related to the defecation of large

⁵ McIntosh, A; McHugh, P. Dunn, N; Goodman, J. Howard, S; Jellyman, P; O’Brien, K; Nystrom, P; Woodford, D. 2010. The impact of trout on galaxiid fishes in New Zealand. NZJ Ecology 34(1): 195-206

numbers of these two birds in particular⁶. The Society understands that Fish and Game NZ are required to produce fish and game management plans. These plans need to recognise and show how these agencies will also ensure the minimisation of nutrients directly entering the lake and its tributaries.

- 4.1.14 Black swan have been measured to produce around 52g dry weight (300g wet weight) per day. Each black swan excrement averages 2.3 % dry weight nitrogen, of which 59% is soluble organic nitrogen. Phosphate averages 0.44%, 30% of that being DRP (Mitchell & Wass 1995⁷). There are, on average, 7000 black swan on the lake, this means that 2,100 kg of black swan faecal matter per day is deposited in or on the edge of the lake.
- 4.1.15 A Canadian goose may defecate every 20 minutes and produce around 679.5 grams per day (French and Parkhurst 2009⁸). 6000 geese therefore produce around 4077 kg of faecal matter per day in the lake and its edge. Canadian geese produce about twice the nitrogen and phosphorus output as that of a Black swan (Spurr & Coleman 2005⁹).
- 4.1.16 There are very few papers in the scientific literature estimating Mallard faecal production. Clark and Gentle (1990¹⁰) produce the closest approximation but do not stipulate a per duck quantum. It is not unreasonable to suggest a Mallard may produce 25% of that of a Canadian goose, or 170g per day. With 6000 Mallards that equates to around 1000 kg per day throughout the lake.
- 4.1.17 Faeces of the Mallard have been recorded to contain 17.4mg Pg-1 faeces, and 53.3mg N g-1 dry weight faeces (Pettigrew et al 1998¹¹).
- 4.1.18 In total, then some 7 tons of game waterfowl faecal matter per day is defecated into the lake, and at the very least in the spring through summer seasons.
- 4.1.19 Currently many researchers are of the opinion that the large nutrient inputs from faecal matter of game birds are only a small component of the total nutrient pool into Lake Ellesmere (CRC and references therein e.g. Hamilton, D. estimation of < 1%).
- 4.1.20 Other overseas data sources comparing water fowl outputs to farm animals, show water fowl have high input potentials, for example fresh manure production per 1000 kg live animal mass per day. (from ASAE 1999¹²) shows the following:

	Dairy	Swine	Turkey	Duck
total manure (kg)	86	84	47	110
Total Kjeldahl N (kg)	0.45	0.52	0.62	1.5
Total P (kg)	0.094	0.18	0.23	0.54

⁶ Canada Goose Management Website. University of Nebraska-Lincoln, NRES 348 Wildlife Damage Management class, Scott Hygnstrom. <http://icwdm.org/handbook/Birds/CanadadGeese/Default.aspx>

⁷ Mitchell, S.F.; Wass, R.T. Food consumption and faecal deposition of plant nutrients by Black Swans (*Cygnus atratus* Latham) in a shallow NZ lake. *Hydrobiologia* 306: 189-197. 1995.

⁸ French, L., and J. Parkhurst. 2009. Managing Wildlife Damage: Canada Goose (*Branta canadensis*). Virginia Cooperative Extension. Publication 420-203. <http://pubs.ext.vt.edu/420/420-203/420-203.pdf>

⁹ Spurr, E. Coleman, J. 1995. Review of Canadian goose population trends, damage, and control in NZ. Landcare Research Science series No. 30. 31pp

¹⁰ Clark, R. G. & G. C. Gentle, 1990. Estimates of grain passage time in captive mallards. *Can. J. Zool.* 68: 2275-2279

¹¹ Pettigrew, C; Hann, B; Goldsborough, L. Waterfowl faeces as a source of nutrients to a prairie wetland: responses of microinvertebrates to experimental additions. *Hydrobiologia* 362:55-66.

¹² ASAE standards 1999. Standards engineering practices data. Hahn, R; Landeck, D; American Society of Agricultural engineers. 1017 pages.

- 4.1.21 Other overseas studies suggest that waterfowl can have significant nutrient inputs – At lake Wintergreen (Michigan) for example Manny et al (1994¹³) show that Canada geese and duck contributed 27% of all N and 70% of all P entering the lake per year from external sources. This is a significant amount.
- 4.1.22 There is limited and mixed evidence regarding waterfowl inputs to lakes. One of the main complications is that sedentary waterfowl (such as swan) outputs are a recycling of the existing nutrient pool (they eat the plant material that has assimilated the inflowing nutrient but do not add additional nutrient, although they may make nutrient more available). This is likely the reason why current investigations suggest that the large water fowl present have only a minor nutrient addition. Migrants on the other hand (including mallard) bring in nutrients seasonally, but also take out nutrient seasonally, probably in a balance.
- 4.1.23 The above information indicates that there is likely to be a significant impact on the lake to a degree far greater than that calculated at present, but that regardless of this nutrient management of fish and game associated with the lake also needs to be carefully managed.

4.2 A SUCCESSFUL BALANCED APPROACH TO LAKE ELLESMERE/TE WAIHORA ECOLOGICAL IMPROVEMENTS

- 4.2.1 The above information indicates that there are considerable levels of nutrients being contributed to the lake's condition that is not solely the fault of the farmer. There are numerous other contributing factors that have given rise to the state of the lake. What is of concern to the agricultural sector is that under the proposed provisions of Variation 1 the intense level of regulation proposed is such that they will have a significant impact on the farming operations in the zone and the ability to provide the economic, social and physical output necessary to achieve the desired outcomes for all parties.
- 4.2.2 This is not to say though that farmers are unwilling to work together with the various parties to ensure a healthier catchment in the future. The Ellesmere farming community is just as concerned about the water quality and quantity of the Selwyn/Te Waihora catchment as other parties are. The historical connections of farmers to this area are highly significant and their care for the land and the water has been substantial over several generations.
- 4.2.3 There are a number of ecological restoration projects of waterways that have taken place in the past and continue to grow in this area. The projects have generally been undertaken as ongoing works in conjunction with Environment Canterbury, Selwyn District Council, streamcare groups (for example the Harts Creek Streamcare Group which is made up of local farmers), Te Waihora Trust and individual landowners. These projects require substantial input from all parties but with the farmer contributing the main proportion of the financing of the fencing, planting, maintenance and retiring of areas of land from production. For the most part these projects have resulted in strong working partnerships with the various parties involved and achieved successful and well planned outcomes.
- 4.2.4 What is proposed in Variation 1 is essentially the forced regulation of such restoration and that projects of the nature described above will fall totally on the landholder to instigate, finance and develop. There are a number of practical reasons why this type of imposition should not be enforced through the proposed provisions but rather continue with the

¹³ Manny, B; Johnson, W; Wetzel, R. 1994. Nutrient additions by waterfowl to lakes and reservoirs: predicting their effects on productivity and water quality. *Hydrobiologia* 279/280: 121-132.

partnership approach via non-regulatory methods. These reasons are explored in the following paragraphs.

4.3 FARMING SYSTEMS

4.3.1 Farmers in the Ellesmere area have predominantly lived and farmed in this area for several generations. They have dutifully cared for the land and ensured during this time that effects on the environment are minimised. Over time farming operations have improved significantly to the extent that now most on-farm operations are highly tuned and of such precision that there is minimal wastage left to the physical environment and in turn the farming enterprise. There are several reasons for this:

- A multitude of agricultural industry advisors and regulators require a high level of compliance to ensure produce from farms meets national and international standards in a highly competitive market;
- Produce leaving a farm, whether that be grain, seed, vegetables, or milk must meet certain criteria to be suitable for consumption. This involves the quality control and precision application of specified pesticides, fungicides, fertilisers and water, along with specified provisions for planting and harvesting;
- The costs associated with: fuelling, retaining and maintaining vehicles; electricity service and provision; diesel servicing; fertiliser and spray and its application; irrigation; and land tillage, are such that a farmer is compelled to ensure that the inappropriate use, and in particular the over use, of such resources are minimised to ensure the minimising of production costs. This in turn has major benefits for the environment. One example is the use of fertiliser spreaders that rely on GPS and control mechanisms that ensure the non-application on anywhere other than the producing area of the paddock itself. Hedgelines and waterways are avoided so as to not apply fertiliser in areas where it will not add any value to the end product. The same can be achieved with precision sprayers. In simple terms it is not cost effective nor environmentally effective to apply vegetation enhancements where they will not result in useful productive outcomes. A farmer does not spray or fertilise hedges so that they grow quicker and need cutting more often, neither would they spray in waterways where the spray would be lost to the flow downstream.
- Farmers now ensure minimising land ‘passovers’ when preparing and maintaining crops i.e. the number of times they have to pass over a paddock with tillage, fertiliser, irrigation etc. in order to achieve the desired level of production. Farmers much prefer now to direct drill¹⁴ crops where at all possible so as to ensure the retention of soil structure, minimise costs associated with time and tractor use, and quicker establish crops. This has both environmental benefits and production benefits.
- Industry specifications also require the clean and tidy maintenance of drainage areas. Where land is not maintained appropriately there is the high risk of development of specific weeds that are not permitted to be grown in proximity of crops.

¹⁴ Direct drilling is the operation of the drilling of new seed into a paddock that has not been worked up since its previous crop was grazed or harvested.

- 4.3.2 Because of these practices there is an inherent obligation and willingness by farmers now to operate in a way that is not only cost effective and efficient but also has major benefits for the environment. It is important that these benefits are also recognised and not constrained in the provisions of Variation 1.

What do some of the provisions of Variation 1 actually propose on the ground for farming?

- 4.3.3 In summary some of the provisions of Variation 1 propose the following:

A. If you are a farmer with land located within the Lake area of the Cultural Landscape/Values Management Area until 1 January 2017 you must have a Farm Environment Plan regardless of whether or not your operation is losing less than 15kg/N/ha/ann. as provided under Rule 11.5.7 for a permitted activity;

B. If you are a farmer with land located within the Lake area of the Cultural Landscape/Values Management Area that is greater than 10ha from 1 January 2017 you must have a Farm Environment Plan from 2017 regardless of whether or not your operation is losing less than 15kg/N/ha/ann. as provided under Rule 11.5.8 for a permitted activity;

Failure to meet the requirement to have a farm environment plan in relation to the clauses for the Cultural Landscape/Values Management Areas as stated above results in the landowner operating a non-complying activity by virtue of Rule 11.5.11.

C. Schedule 7 – Farm Environment Plans must include additional matters of assessment relating to any known mahinga kai, wahi tapu or wahi taonga within any property located in the Cultural Landscape/Values Management Area and also reduce the loss of phosphorus and sediment within the Phosphorus and Sediment Risk Zone;

D. Schedule 24 – Farm Practices proposes to require a 5m vegetative strip alongside all waterbodies and drains from which stock must be excluded, and that in areas of cultivation a 2m uncultivated vegetative strip must be maintained around all waterbodies and drains.

E. Restrictions on groundwater and surface water takes that have high or direct hydraulic connection to specific lowland waterways and new minimum flow levels of cut off for irrigation activity.

- 4.3.4 The above provisions are just a few of those submitted on by the Society and which have already been commented on in the Section 3 of this statement. However, the matters above require further specific explanation.

4.4 CULTURAL LANDSCAPES/VALUES MANAGEMENT AREAS AND RIVER ZONES

Development of Cultural Landscapes/Values Management Areas and Consultation

- 4.4.1 The Society fully respects the values associated with Lake Ellesmere/Te Waihora and the cultural significance of them. Ellesmere farmers have for several generations worked, lived and socialised alongside the Maori people of this area and have a sound respect for and knowledge of the cultural features and history. The local Ellesmere community continues to foster cultural relationships through all the Ellesmere schools which have learning programmes, initiatives and consistent interactions with the Ngati Moki marae at Taumutu.

- 4.4.2 During the course of the Variation 1 development process the Ellesmere Irrigation Society, Waikekewai Stream catchment farmers with shallow wells that are considered by the CRC to be stream depleting, CRC representatives and Ms Dyanna Jolly (who at that time was representing Te Taumutu Runanga) negotiated with Te Taumutu Runanga regarding water takes near the Waikekewai Stream in Sedgemere. This was an open negotiation which resulted in major conciliations on behalf of the farmers who agreed to the provisions about ceasing the use of unproven stream depleting wells when their consents expired. This negotiation and agreement between the parties has formed the basis of the provisions for the Waikekewai, excluding minimum flow levels and the location of the Cultural Landscapes/Values Management areas and River Zones. The proposed changes to the minimum flow levels were not consulted on as part of the wider community focus group meetings held over 2012 and 2013. They were consulted on more directly at one meeting in each affected area in 2013. At no point during these negotiations was there any mention of the proposed CLVMA or River Zones.
- 4.4.3 The CLVMA and River Zones were not consulted on with the wider and directly affected community in a way that allowed for changes to the areas to be made or feedback considered or recognised. Only one meeting was held at Southbridge to inform those present what was going to be included in the Variation. This was not a consultation meeting but rather an information meeting about the entire Variation and during the First Schedule (RMA) consultation phase which the Society was excluded from. It was at this meeting that those parties directly affected by these proposed zones were first made aware of the CLVMA and then the River Zone areas in the form of a map. This map was not notified as part of Variation 1. Consequently, there has been no ability to communicate the considerable concerns associated with these zone provisions.
- 4.4.4 In addition to this, the Society has concerns that there has been a disconnection between the CRC, tangata whenua and those parties directly affected by the proposed provisions. The Society considers it unfortunate that such significant provisions were not openly consulted on with the directly affected parties; the owners of the land on which the CLVMA now appear. Also, there are concerns that recommendations in the Section 42A Officer's Report have been based on a technical memorandum relating to the appropriateness of the River Zone 20m margin from Ms Dyanna Jolly who had acted for Te Taumutu Runanga (a submitter on Variation 1) during the Variation development process and informing the Selwyn Waihora Zone Committee¹⁵. Ms Jolly has provided a perspective in relation to the submissions on the River Zone and CLVMA. The Society in taking advice from the Auditor General's Office considers this to be a conflict of interest and that the Officer Recommendation/s based on this technical memorandum should be withdrawn.¹⁶ The Society is genuinely disappointed at having to bring this before the Hearing Commissioners.

Non-Regulatory Approach

- 4.4.5 The Zone Implementation Plan (ZIP) sets out the intentions of what is to be achieved in relation to riparian planting and protection of waterways. The ZIP promotes the gradual improvement of these areas dealt with on a one-to-one basis with each individual farmer and incorporating a combination of funding and voluntary land retirement. This is the type

¹⁵ Recorded in Selwyn Waihora Zone Committee Minutes 1 October 2013, Session 2, Cultural Landscape and Mahinga Kai Areas.

¹⁶ The Society approached CRC Officer's on this matter and they considered that Ms Jolly's assessments have been consistent and as a consequence they do not have an issue with her participation at the Section 42A phase. CRC has guided the Society to bring this before the Hearing Commissioners should the Society still have concerns. While the information from Ms Jolly has been consistent, this does not expunge the fact that Ms Jolly has previously acted for the submitter throughout several phases of the Variation process but has then been engaged by the CRC to provide what should be an independent response given that it relates to submissions.

of non-regulatory method of implementation that works well at present and is supported by the Society. However, what is proposed in the Variation is a significant shift from this type of partnership. The provisions of Variation 1 firmly place the setting aside of these areas and their ultimate redevelopment firmly at the landholders expense and promotes a setting aside of private land currently used for farming and other uses by imposing a zone with a specific margin from the stream or lake beds. It also places a considerable burden on the remediation of the historical degradation of the lake on those parties who own land directly adjacent to the lake and particular streams. In consulting with a real estate agency in this area, it was conveyed that the consequences of having such a zoning on a property was likely to have a considerable impact on not only the attractiveness of the property for purchase but also its value.¹⁷

- 4.4.6 As previously mentioned and as recognised in the Variation itself, the degradation of the lake has occurred over a significant amount of time and is the result of many years of contaminants settling in the lake and its inability to 'flush' itself to a better extent. It is questionable as to what has been the main contributing factor and as such a broad scale approach is proposed to try and assist the remediation of the state of the lake. Farming is just one of the many factors relating to this situation. However, what is proposed by the provisions of the CLVMA is a much greater input by those who are located adjacent to tributary streams and at the edge of the lake and lagoons. Therefore they will carry a much larger burden than all the other enterprises in the catchment for what is an entire catchment issue. This further promotes the success of the existing partnership programme where farmers, streamcare groups, CRC, Selwyn District Council and the Te Waihora Trust have worked well together in the past to create specific regeneration areas. Harts Creek and Boggy Creek are a great example of the work programmes going on in the area. They are the result of careful planning, consultation and appropriate restoration programmes.

Harts Creek Streamcare Project

- 4.4.7 The Barnett Partnership are just one farming entity that farms next to Harts Creek. For a period of approximately seven years the Barnetts, like many other farmers along Harts Creek, have contributed to fencing, setting aside portions of land, planting, maintaining and caring for newly created restoration areas. The areas set aside vary considerably in width and character. There are areas of planting that are narrow in width and other areas that are much wider depending on the topography and character of the land. A broad-brush 20m imposed band does not relate positively to what might actually occur in practice and what works well. It is likely that if farmers were 'required' specifically by regulation in the Variation to set aside such areas then restoration projects would take a lot longer and would not be done to the standard that is currently the case under the non-regulatory methods. This is largely due to the cost of such development and the time associated with it. The current streamcare partnership setup is a far better mechanism and provides positive outcomes for all the parties involved.
- 4.4.8 The costs to date of the project on the Barnett Partnership land are provided below:

¹⁷ Pers.comm, Mr S Knowler, Matson and Allan Real Estate Leeston, September 2014.

Activities/Actions	Cost
Land set aside 0.8 Ha at \$50,000 per hectare Note: There is no contribution made for the costs of retired land by the regulatory authorities and other parties involved in the project. The land is effectively donated to the 'environment'.	\$40,000
Clearing land	\$5600
Planting costs	\$7600
Maintenance weeding and spraying Note: There is more direct spraying required in restoration projects than there are for straight farming activities near waterways.	\$7000
Fencing	\$4000
Potential loss of income per annum from land no longer used for farming.	\$8000
TOTAL: \$72,200 plus on-going \$8000 per year \$7000 was funded by the CRC and its partnership with the Te Waihora Trust, remainder funded by Barnett Partnership.	

4.4.9 As can be seen above the costs are considerable.

4.4.10 If the requirement was to impose a 20m area from these streams, the cost to the Barnett Partnership without input from the streamcare groups and regulatory parties would be in the vicinity of \$200,000 to \$250,000 for the same frontage to Harts Creek as presented above, plus a higher continued loss of income.

4.4.11 Another example, of the costs associated with such development on land that has frontage to the Irwell River relates to the Waipuna farm at Irwell. This farm has a considerable frontage to that river. The estimated costs are as follows based on only a 5m setback:

Activities/Actions	Cost
Frontage area based on 5m setback equals 8.8km/4.4ha at \$50,000 per hectare	\$220,000
Clearing land	\$26,400
Planting costs	\$35,200
Maintenance weeding and spraying	\$28,000
Fencing	\$16,000
Potential loss of income per annum from land no longer used for farming.	\$44,000
TOTAL: \$369,600.00 plus on-going \$44,000 per year	

Again the cost would be considerably more based on a 20m setback, potentially in excess of \$1 Million.

4.4.12 The best method to facilitate restoration and further protection of lowland streams and rivers is to carry on in the non-regulatory manner as this would ensure:

- Faster restoration development;
- Positive uptake of restoration initiatives by landowners;
- Continued funding from regulatory authorities and other parties who have already recognised their interest in the waterways i.e. Te Waihora Trust;
- Ensuring other funds remain available i.e. Central Plains Water Scheme Environmental Fund and private funding e.g. Honda Care Fund;
- Development of planting that was appropriate to best enhance the streams and at the same time recognise the importance of the adjacent land uses by having various distances of planting depth where planting was necessary; and
- Education benefits through involvement of local schools e.g. Southbridge School restoration planting project undertaken in conjunction with Rakaia Island Dairies and the CRC.

Riparian management and water quality

4.4.13 It is expressed in the Section 42A Officer's Report that the 20m River Zones are required to be this distance to protect various sites of importance to tangata whenua and that a holistic broad-brush zoning approach is preferred over the spot site approach in other plans. The report also considers that the 20m setback is consistent with other planning documents, including the Proposed Land and Water Regional Plan.

4.4.14 The Proposed Land and Water Plan does not contain any protective zonings around streams and neither does it contain provisions that require all land use activity to be monitored by virtue of its location being within 20m of a stream/river. However, there are a number of rules in the PLWRP that more than adequately recognise and regulate any potential adverse effects that might have an impact on matters of cultural significance. These rules relate to the requirements to obtain resource consent if the activity is located within 20m of a surface water body i.e. Discharge of waste water, onsite waste water disposal, hazardous substance storage, greywater, pit and composting toilets, animal and vegetative waste, stockholding, animal effluent disposal, location of cemeteries and the taking and use of water. In addition, the Selwyn District Plan contains a number of protected sites of significance to tangata whenua which also have rules relating to their protection from adverse environmental effects. These are shown specifically on the planning maps of that plan as Wahi Taonga Management Areas and are shown in **Annexure B** attached.

4.4.14 These maps show that there are specific sites located in the Taumutu area (important because of its location to the Ngati Moki Marae and the associated history) but very few shown around the more northern areas of the Lake edge where the CLVM areas are proposed. Therefore the additional requirement of the CLVM areas in addition to the provisions of the PLWRP and the Selwyn District Plan becomes an unnecessary additional tool that would not result in any further protection of sites beyond that which is already contained in these plans. It creates an additional restriction and the potential for increased costs associated with farming activities and the development of farm plans. While the Society respects the concerns of tangata whenua provisions in the Variation, these provisions

need to be justified and warranted where there would not already be sufficient protection. It is considered that the provisions of Variation 1 in relation to the development of farm plans, the requirement to meet certain levels of nutrient management will provide the additional protection to the environment that will more than adequately ensure protection of the valued cultural sites. By 2017 all farms will be required to have a Farm Environment Plan so to require one just because you are located near the Lake or a stream is onerous, particularly given that the issues with the water quality and quantity of the lake and the streams is a catchment wide issue, and not just one to be more heavily apportioned to those that farm near it. In reality those farming near these areas have less nutrient runoff because of the heavier soil types than others in the zone and the less intensive land uses of arable farming.

What is the intent of the Lake and River Zones

- 4.4.15 Given the degree of protection of cultural sites under the PLWRP and the Selwyn District Plan it appears that the CLMVA may be used as a tool in the future to place further restriction of farmers in these areas. For example, and while not specifically mentioned, it may be intended that these areas be earmarked for extensive restoration planting. The Variation provisions require landholders with land subject to these zones to have additional assessments and potentially land treatments. There is currently no conclusive evidence that riparian setbacks or riparian vegetation result in better nutrient quality in-stream, or that any overland flow from arable farming has a nutrient input issue. There is evidence that shade affects gross primary production and ecosystem respiration in streams (Burrell et al 2014¹⁸), to an extent that eutrophication in-stream can be mitigated by shade.
- 4.4.16 A recent thesis (Collins, K. 2013¹⁹) from Lincoln University evaluated the impact of riparian plantings on water quality using a case study on lowland streams in the Lake Ellesmere/Te Waihora catchment. It concluded that riparian restoration had a positive effect on water quality in terms of increasing dissolved oxygen and decreasing turbidity, but also resulted in an increase in conductivity. Planted buffer strips, it concluded may be effective in improving some water quality variables, but not nutrients (e.g phosphorus) or bacteria. As with many such studies in New Zealand there is no definitive answer as to the role and need of vegetated stream edge setbacks. Again, this puts into question the need for such setbacks when the site-by-site development and restoration of stream ecology is better treated in the non-regulatory manner that is currently the case.

River Zone Maps

- 4.4.17 The planning maps notified with the Variation show large areas of land shaded to be within the proposed CLVMA. This includes surrounds of Lake Ellesmere/Te Waihora, Muriwai/Coopers Lagoon and an area that stretches between these two waterbodies including Taumutu. The River Zone areas were not notified on maps. They were listed in Table(n) and referred to as appearing on maps that were not notified. Therefore they were not available for public scrutiny and nor were they previously consulted on. The Society notified the Council of this in its submission. These maps were not amended and re-notified. Therefore there are no legal grounds for now inserting these areas in the plan under this document. The Section 42A Reporting Officer has suggested amending this error by taking out reference to the planning maps in Table(n). However, the Officer has incorrectly used the Society's submission to undertake this amendment. The Society has not requested the

¹⁸ Burrell T.K., O'Brien J.M., Graham S.E., Simon, K.S., Harding J.S., McIntosh A.R. (2014). *Riparian shading mitigates stream eutrophication due to agricultural land use*. Freshwater Science 33: 74-84.

¹⁹ K. Collins (2013), Lincoln University, 'Benefits of riparian planting: A case study of lowland streams in the Lake Ellesmere catchment'

deletion of the CLVMA or River Zone. The Society has only requested a reduction in the area to 10m around the Lake and Coopers Lagoon and the removal of certain streams from the River Zone list – there is no request to remove reference to the River Zones on the planning maps. While the Society has also referenced “any consequential amendments” in its submission, these would only relate to where they assist the nature of the submission. In this case the Officer Recommendation does not assist this submission nor the understanding of the provisions. Given this error there is no avenue now left other than either notification of the relevant maps or an appeal to the High Court. In either case the requirement would likely be notification of the maps.

- 4.4.18 The Society considers that the River Zone for these particular streams is not required given that other provisions of the Variation and the PLWRP already adequately provide protection of the cultural sites. If there was a case to insert a River Zone for the other streams that may have not been requested by submitters to be removed then it is imperative that these be shown on a planning map. This is to ensure that any relevant zones are shown in their correct location and it would be very unusual to have plan provisions that relate to a zone that is not classified on a map. It is a necessity for interpretation reasons.
- 4.4.19 A good example of why such action is required can be observed in the case of the Waikekewai Stream near Southbridge. For many years this stream has appeared on various planning documents and references used by the CRC to include a large stretch of land where the stream has not flowed for several decades (at least 60 years and prior to irrigation development), and certainly not during the lifetime of many of the family farmers in the Waikekewai Stream area. It is also known that along a stretch of the creek a water wheel was removed in the 1930’s because the creek did not flow there any more. This was largely because of a shift in the location of the flow of the North Branch of the Rakaia River which affects the streams in the Little Rakaia Zone.
- 4.4.20 Attached as **Annexure C** is the map commonly used by the CRC as the delineation of the Waikekewai Stream. It indicates that there is a stream flow starting at a northern most point near the edge of Southbridge Township. Photograph 1 of **Annexure C** shows the nature of the land at this point and clearly indicates that there has been no stream flowing here for many many years. This photograph was taken this year after a significantly wet winter and shows no indication of stream banks or flow. It appears as part of a farm paddock and is currently sown in crop. Further photographs show various farm landscapes in areas where this stream has been referred to by the Council as flowing. In the locations shown in Photographs 1 to 4 there are neither permanent or temporary flows. The map also shows where the stream starts to flow once the Parkin Drain joins it.
- 4.4.21 This example highlights the importance of maps and the relevance of what is proposed by these zones. This matter has consistently been brought before numerous CRC officers over the last 12 years. Unfortunately this still results in the use of incorrect data and the application of provisions that are not applicable to what is located on the ground.

4.5 SCHEDULE 7 – FARM ENVIRONMENT PLAN AND SCHEDULE 24 – FARM PRACTICES

- 4.5.1 There are a number of changes proposed to the Farm Environment Plans and Farm Practices Schedules (Schedules 7 and 24). The Reporting Officer has recommended only some very minor changes to them. A number of submitters have opposed them and suggested new provisions.

Schedule 7 – Farm Environment Plans

4.5.2 The Society's main concern with the changes proposed to Schedule 7 is the additional need to show the location of mahinga kai, wahi tapu and wahi taonga within a property located in the CLVMA. It is inappropriate to require their insertion in a farm environment plan for the following reasons:

- These sites are already located within the Selwyn District Plan and protected under a number of provisions in that plan;
- The PLWRP contains a host of rules that protect these sites from any significant adverse environmental effects;
- Such sites are difficult to locate in practice as there is often nothing physically recognisable on land and may lead to disagreements between landowners and the regulatory authority and/or more stringent requirements where they are not required;
- Potential for increased land use treatments and the associated costs by farmers in the lowland area to address issues that are a catchment-wide issue but that these farmers are having to fund the restoration of the effects;
- The other requirements of Schedule 7 will already adequately and appropriately protect any sites of cultural significance.

4.5.3 The Variation also proposes the insertion of new provisions in Part B clause 5(a) that states:

"Curtail the loss of phosphorus and sediment loss rate within the Phosphorus and Sediment Risk zone."

4.5.4 From what can be viewed in the maps as the Phosphorus and Sediment Risk zone is that it is based on the soil types in the area, i.e. heavier soils. The risk around phosphorus and sediment has much less to do with soil type but more to do with the topography of land where runoff may occur. In other words clause 5(a) would be better to read as:

"Reduce the loss of phosphorus and sediment."

This would mean that all farms had a duty to minimise phosphorus and sedimentation loss levels which would then compliment the second proposed bullet point to be inserted in clause 5(a) that requires the achievement of Good Management Practices for Nitrogen and Phosphorus loss from 2017. Additionally it would mean that the Phosphorus and Sediment Risk zone could be removed thus removing problems relating to where it covers some parts of farms and not others. A more general requirement by all farmers as suggested above would be more equitable and much easier to achieve in practice. The Society has requested the removal of the Phosphorus and Sediment Risk Zone from the planning maps in its submission.

4.5.5 In practice farmers would deal to specific phosphorus or sediment risk areas on their specific farms by firstly identifying them and then determining the treatment that might assist with reducing these nutrient levels, i.e. specific area of specialised planting that may be of particular assistance. It is not in the best interests of farmers to lose sediment or phosphorus from paddocks. These two components are essential to retaining good crop development and maintaining quality soil structure. Because of this, farming practices

already work in such a way so as to ensure minimal sediment and nutrient loss. Sediment and nutrient loss equates to loss of productivity and therefore profitability, and also degradation of the physical farming environment over a longer period, which may in turn result in loss of farm value. None of these outcomes are acceptable to farmers in their everyday practices.

- 4.5.6 Sediment and phosphorus loss is most likely to occur where the topography of the land is such that runoff may go directly into a waterway. As described above farm practices aim to minimise runoff to ensure the best outcomes for the crop and farm environment. Paddocks and their drainage mechanisms are designed in a way to minimise runoff and loss of soils. Consequently there are few instances where paddock drainage will occur in large moving sheets of water. They will more likely drain from a depression in a paddock where the topography is depressed. The water will either sit within this depression and slowly drain beneath or evaporate over time. Where more direct drainage might occur from a paddock, then this will occur at specific points.
- 4.5.7 For the most part drains are designed to intercept the water table in times of high rainfall and transport this water to an outlet which either goes to the sea or Lake Ellesmere in this catchment. This means that it is not paddock runoff from the surface that is entering waterways but rather subsurface water that is rising from the ground as a result of the water table rising. By draining this water it is therefore not infiltrating paddocks and oversaturating them from both beneath and from the surface rainfall directly above. Once the water table drops then the water in the drains disappears.
- 4.5.8 Drains are designed purposefully to remain dry for the majority of the year and only really contain water during high rainfall events. The 2014 winter season has been wet and high rainfall events began in March. 2014's March and April combined rainfall was recorded as the highest rainfall for these months since records began. Even with this rainfall the drains cleared and dried quickly. It is noted too that this rainfall caused major issues for the crops that were yet to be harvested due to machinery being unable to venture into paddocks to do the harvest work and that moisture content in crops was too high to allow them to be suitable for harvest, storage and ultimate sale. Abundance of water in the Ellesmere area is far more of an issue than a lack of it and this is why any plans to promote augmentation of water into the system should be carefully considered before application given the significant downstream effects. Augmentation should only occur once the full effects of the Central Plains Water Scheme manifest.²⁰

Schedule 24 – Farm Practices

- 4.5.9 It is proposed in Schedule 24 that there be specified farming practices in relation to intensive winter grazing and cultivation. Within both provisions (c) and (d) setbacks are prescribed for rivers, lakes, artificial watercourses but excludes irrigation canals or stock water races in relation to intensive winter grazing and cultivation. Drains are not excluded from these provisions when in all practical circumstances they should be. For most of the year drains are designed to be clear of water. This is recognised in other recommendations on Variation 1 where exclusions are made for artificial watercourses that are ephemeral in nature i.e. see Officer Recommendation on Rule 11.5.18 relating to stock exclusion, page 339 of Officer Report.

²⁰ Some members of the ESI were submitters on the Central Plains Water Scheme consent applications based on their concerns relating to water mounding that might occur as a result of the Scheme (Lowland Farming Group). These concerns were later addressed as conditions of the Scheme consents.

4.5.10 The recommendation in the Officer Report proposes a change to what intensive grazing means and that it only relates to “significant pugging or de-vegetation. This is usually associated with break feeding behind temporary fencing”. Where this was to occur a 5m vegetative strip is required from which stock is excluded near the waterbody. The impracticality of this is that:

- This would require fencing off considerable areas of paddock where there is no water flowing in the adjacent waterbody. Pugging can happen when there is no water flow in drains;
- Drains and waterbodies are generally accompanied with banks or edgings that do not allow direct runoff from pugged areas and it is not advantageous to have animals entering waterbodies during high rainfall periods as they may become trapped or cast in the waterbody resulting in loss of life or injury. It is within the farmer’s best interests to prevent animal loss or injury and these situations are generally dealt with through fencing where a serious risk presents itself. Where drains are deep sided animals are unlikely to venture in them because of the risk level associated with the access;
- In the case of larger waterbodies that flow constantly, or lakes, vegetative margins naturally occur because of the terrain associated with them i.e. lake margins are characterised by the bank topography - where it is steep then there may be a wider than 5m distance from the water, where it is beach-like in character then it might be narrower. However, the level of grazing adjacent to these waterbodies will vary because of the boggiess of the area. For instance, intensive break feeding immediately adjacent to a lake is unlikely because of the boggy nature of lake edges in the Ellesmere area. Intensive break fed crops cannot be sown in these areas because farm machinery cannot be risked close to these margins, therefore it becomes self-regulating. Much less intensive grazing occurs in these areas;
- Lowland streams generally have steeper vegetated sides that are not suitable for grazing or cultivation and therefore stock does not actively go in them. These areas are normally vegetated on their banks where stock do not generally venture and for the most part are not cultivated.

4.5.11 Given the above, the intensive winter grazing provisions become redundant and in any event would be extremely difficult to monitor.

Cultivation

4.5.12 Clause (d) of Schedule 24 proposes a setback of 2m for cultivation adjacent to rivers, lakes, artificial watercourses (excluding irrigation canals or stock water races) and wetlands and that this setback contain an uncultivated vegetative strip. Again, this clause does not exclude ephemeral waterbodies including drains. The proposed clause is inappropriate for the following reasons:

- A 2m uncultivated strip would result in significant areas of farms being left to grow weeds and other pests that would significantly inhibit the ability to grow specialist crops within a significant distance. Industry specifications also require the clean and tidy maintenance of drainage areas. Where land is not maintained appropriately there is the high risk of development of weeds that are not permitted to be grown in proximity of crops. These include:
 - Hemlock – noxious weed regulated by the CRC;

- Black Grass – a highly intrusive and destructive grass that has recently been discovered in New Zealand and if established further could destroy the rye grass industry in the country. Rye grass production is essential to the seed industry and the associated sheep, beef and dairy industries;
- Nodding thistles – prohibited weed that farmers have to remove by hand;
- Wild Carrot – easily spread weed that must be eradicated within a 3km distance of a produce carrot crop due to cross pollination risk which would potentially make carrot seed crops worthless and un-harvestable. The photograph below shows wild carrot growing near a drain where it has not been eradicated.



These are just a sample of the many weeds that must be eradicated from farms in order to ensure compliance with industry standards for crop and pasture production. Failure to keep drainage areas and paddock margins clear of these species results in crop rejection and loss of complete productivity.

- The techniques used to grow crops would not be functional in that where cultivation had to occur i.e. a paddock grown in worked up land for wheat, could then not be direct drilled around the edges because this would involve the destroying of the part of the paddock already drilled after cultivation. For example the tractor and drill would need to travel over crop drilled by another means and would therefore destroy it;
- Cultivation ordinarily is determined by topography and the need for farmers to keep machinery a certain distance from drains or creeks in order to ensure that machinery does not travel into the waterway. This would be highly destructive to the machinery and therefore undesirable;
- Given that drains are predominantly dry and paddocks do not normally drain in large sheet movements across soil to the drains, then there is no reason for restricting cultivation near them;
- Cultivation near a drain or waterway to a variety of widths occurs on a case-by-case basis and a 2m setback could be more detrimental to the environment in that weeds will grow here and cause blockages and biosecurity risks. Because of this cultivation is more beneficial to waterways than it is unbeneficial;
- Forestry is excluded from this clause and it is one of the most detrimental land use activities to waterways, particularly during runoff in harvest times and the lack of vegetation under canopies;
- Ephemeral drains should be excluded as they are predominantly dry most of the year and therefore no threat to nutrient runoff;

- Farmers direct drill²¹ crops where at all possible so as to ensure the retention of soil structure, minimise costs associated with time and tractor use, and the quicker establishment of crops. This has both environmental benefits and production benefits.

4.5.13 The above information illustrates the impracticality of such a provision. These matters were considered previously under the PLWRP and excluded precisely because of the impracticalities associated with them. It is the view of the Society that there is no need for this clause relating to cultivation and this would be consistent with the provisions of the PLWRP. Cultivation assists considerably to the protection of waterways and causes minimal effect in comparison to activities such as forestry. If there was any need for such a clause, then this should only be limited to rivers, lakes and wetlands where machinery for the most part would not be able to go any closer than this because of topography restrictions.

4.6 MINIMUM FLOW LEVELS FOR LOWLAND STREAMS

4.6.1 Variation 1 proposes changes to the minimum flow levels of lowland streams in the Ellesmere area and when these changes in levels will be implemented. The Society has submitted on various areas of these provisions but predominantly the main concerns are:

- The timing that the new minimum flow levels would be imposed; and
- The actual levels proposed on some streams and rivers.

Timing of Implementation of Minimum Flows on Groundwater and Surface Water Takes

4.6.2 The proposed minimum flow levels for streams and rivers set out in Table 11 (c) will result in a significant rise in many streams which would prevent irrigation occurring for both groundwater and surface water takes. The groundwater takes are those that are considered by CRC modelling to be hydraulically connected to the streams and having a stream depletion effect of greater than 5 l/s. It is noted that actual aquifer testing in the Ellesmere area proves that desktop CRC modelling over estimates the level of connection as was previously presented in the PLWRP hearing. This information is contained again for your information in **Annexure D** attached.

4.6.3 Table 11(c) proposes that the new minimum flow levels not be inserted on consents to take water until 2025 and on the expiry of consents. There are a number of reasons for this:

- This timeframe was consulted on specifically and agreed to by the Society and Te Taumutu Runanga. This was because they were the most impacted parties and this formed a considerable part of the agreed position statement between these two parties and the negotiations around provisions relating to the Waikewai Stream which is now contained in the ZIP Addendum;
- To allow the imposition of such conditions before the expiry of these consents would put consent holders/farmers at considerable viability risk. This is because:
 - a. They have only just recently had new minimum flow conditions imposed on their consents at levels that differ from those proposed in the Variation via the Rakaia Selwyn Groundwater Consent Review. This has resulted in some major expenses

²¹ Direct drilling is the operation of the drilling of new seed into a paddock that has not been worked up since its previous crop was grazed or harvested.

and redevelopment of farm irrigation systems in order to comply with the new consent conditions. Some of these conditions are still only just being put into action now because of the staged nature of them. Essentially they are now new consents that if they were to be addressed again in 2025 before expiry then this would potentially result in yet another review that would be significantly hindering again;

- b. The 2025 date is based around when it is likely the impact of the Central Plains Water Scheme (CPW) will reduce the amount of groundwater used in the catchment and the potential of the stream flows to increase because of it. Other evidence at this hearing will also confirm that there can be no real surety about the timing or the extent of the impact that the CPW Scheme will have. The impact of increased groundwater flows may be quite quick (for example evident in 2020) or they may be significantly delayed (for example evident in 2030) or the level of impact may be significantly more or less than the level which is anticipated by modelling by virtue of the fact that all modelling comes with a level of assumptions made which may not necessarily truly replicate what will happen in reality. This is why much care is required around the timing and method of stream or groundwater augmentation. To essentially require a review of consents in 2025 for minimum flow condition purposes may have no relationship to when the physical outcomes of the CPW Scheme eventuate;
- c. Changing minimum flow levels on streams does not change the flow of those streams in the Ellesmere area to any great degree and certainly does not have the desired outcome of making the streams have more water in them. That is largely determined by weather events;
- d. The date, if it were to be imposed without the expiry of consents, would attribute the burden of stream flows to those farmers who operate near them and not recognise the cumulative impact of the water used in the entire zone and therefore be left with only very few farmers being responsible for the remedial costs of it. The Table below highlights the few farms caught by these provisions per stream;
- e. Dealing with constantly changing minimum flow conditions comes at a significant financial cost. It is more appropriate to impose this at a time when the consents expire than to require it beforehand. Farming is not an activity that can easily cope with constant requirements to change systems of irrigation, which is what is necessary when conditions of consent change. There is not only a financial cost involved but a considerable amount of reconfiguration of pipework and paddock design etc. to change. See **Annexure E** for the costings to establish just one new well and its associated infrastructure;
- f. After 2025 there will be a steady renewal of approximately 19 groundwater consents in the Ellesmere area that may have some wells that were considered under the consent review to be stream depleting²². Their level of connection is much less in reality than what has been modelled by the CRC and potentially only very few of these wells if they were aquifer tested, may be actually stream depleting beyond the 5 l/s threshold. Therefore the threat of any harmful activity by these consents is unlikely between 2025 and their expiry.

²² The groundwater consents are the ones that are more hindered by minimum flow conditions as they are generally the ones more depended on for irrigation in this area.

- 4.6.4 Based on the above, the Society stands by its submission to support the 2025 date and only review minimum flow levels on consents when they expire.

Proposed Changes to Minimum Flow Levels in Streams

4.6.5 The Variation proposes several changes to the existing minimum flow levels of lowland streams as well as place continued minimum flow levels on drains. The Society submission requests alternative flow levels on some streams and the retention of the existing levels shown in the Variation on others. The Table below demonstrates the levels proposed by the Society, what the Variation contains and the ecological levels proposed by Golders who undertook the ecological assessment of these streams on behalf of the CRC. Flow records supplied by the CRC are attached as **Annexure F**.

Stream	Variation Limit	Golders Limit	EISI Limit proposed	Type of Waterway	Number of Existing consents that CRC consider to have hydraulic connection	EISI Commentary
Birdlings Brook (at Leggs Road)	440	446	150	Spring fed creek with a variety of substrates. Begins just west of Leeston township and connects with Harts Creek approximately 2km from Lake Ellesmere/Te Waihora. It has two flow recording sites which are manually recorded both within close proximity of one another.	Two groundwater consents: CRC010837 expires 2035; CRC094313 expires 2030.	Flow recorded by CRC only since 1999. The flow recordings show that the flow of Birdlings Brook has only been at or above 440 l/s for three occasions: once from October 2010 to 1 December 2010; June 2011 and then in December 2013. Therefore the limit proposed in the Variation would curtail any real reliability of groundwater takes in this area. There are two groundwater takes linked to Birdlings Brook so increasing the level of the limit would substantially penalise these two parties for a problem that is created cumulatively over the entire Selwyn Waihora zone. The existing limit of 150 l/s retains some reliability and at the same time protects the groundwater use in the area, given the low level of consents connected to this stream. To change the limit before the expiry of these consents would result in the consents becoming unusable and completely unreliable. Consequently having major economic and social impact on those parties affected.
Birdlings Brook (at Lochheads Road)	480	480	200		Two surface water consents: CRC962109 expires 2031 and allows only 2 days take per 30 days; CRC012171 expires 2031.	During the Rakaia Selwyn Consent Review it was determined that conditions of consent could not be imposed that would render the consent unusable. Also, it was noted that a change of condition to a consent could not change the expiry date of a consent.
Boggy Creek	261	261	100	Man-made drain developed by farmers in the 1920s to	Four groundwater	Flow recorded since 1970. The flow recordings show that the flow of Boggy Creek

Stream	Variation Limit	Golders Limit	EISI Limit proposed	Type of Waterway	Number of Existing consents that CRC consider to have hydraulic connection	EISI Commentary
				assist farming in Brookside area. Begins in Brookside west of Doyleston Township and then flows to Lake Ellesmere /Te Waihora. Significant planting and restoration programme along creek banks.	<p>takes:</p> <p>CRC961610 expires 2031; CRC011510 expires 2035; CRC022120 expires 2035; and CRC0012551 expires 2019.</p> <p>Two surface water takes: CRC042844 expires 2039; CRC890642 expires 2029.</p>	<p>is actually improving to what was experienced in the 1970s and 1980s. During these periods the creek had numerous recordings of levels below 100 l/s during both summer and winter conditions. But more noticeably there were few recordings over 261 l/s. This indicates that the levels of Boggy Creek proposed by the Variation and Golders represent something that may not be achievable, or if it is it might be at the significant detriment of the Ellesmere farmers. If water levels were being retained at the 261 l/s during summer months then the water table would be far too high to continue arable farming or horticulture in this area. This is because soil moisture would be too high for crops to dry properly or too wet for harvesting machinery to enter paddocks, and because the waterway was originally developed to drain the underlying water table. While this might occur naturally from time to time it is not something that would be envisaged each year. The 100 l/s currently only relates to a small number of consents and it is likely that some of these consents are no longer being used even though they are still active. This is because it may be only one well on these consents that is attached to a minimum flow condition while other wells on the consents remain unaffected by a minimum flow condition. Some farmers may have adjusted their irrigation infrastructure to compensate for their existing minimum flow levels for the rest of the consent period.</p> <p>It is also noted that the Council's irrigation restriction website recorded Boggy Creek at 254 l/s on 20 September 2014. Before the irrigation season has even started then the level of the Creek is below the suggested minimum flow point. This is after one of the wettest winters the Ellesmere area has</p>

Stream	Variation Limit	Golders Limit	EISI Limit proposed	Type of Waterway	Number of Existing consents that CRC consider to have hydraulic connection	EISI Commentary
						experienced for some time. This further illustrates how inappropriate these new limits are. At the proposed new level the existing consents would become unreliable and to a degree far higher than is currently experienced.
<p>Harts Creek (at Lower Lake Road)</p> <p>And</p> <p>Harts Creek (at Timbervard Road)</p>	1100	867	1000	<p>Spring fed creek with a variety of substrates. Begins flowing approximately 1.25km southwest of Leeston township. Harts Creek is joined by Birdlings Brook approximately 2km from Lake Ellesmere where it flows into. Significant planting and restoration programme along creek banks.</p>	<p>Four groundwater takes:</p> <p>CRC971182 expires 2031; CRC962108 expires 2031; CRC970963 expires 2032; CRC990401 expires 2034.</p> <p>Six surface water takes:</p> <p>CRC145910 expires 2031; CRC011883 expires 2040; CRC012171 expires 2031; CRC962103 expires 2031; CRC962108 expires 2031; and CRC970354 expires 2031.</p>	<p>The information provided to the Society regarding Harts Creek from the CRC only shows recordings since 2006 at the Timbervard Road site and 2009 from the Leeston Lake Road site.</p> <p>The flow recordings show that the flow of Harts Creek is more constant and uniform compared with other streams. It has higher flows for a sustained period in winter months and reduces its flows starting from September when groundwater pressures reduce as large scale water consumption in the upper plains begin.</p> <p>To our knowledge there is no recording taken at Lower Lake Road as specified in the Variation. The recording is done at Leeston Lake Road and therefore any limit should specify the correct recording site. There is only two years of records available here from 2010 to 2011 and one reading for 2006. All readings except for the 2006 one are just above the 1100 l/s limit proposed. However it is known that this Creek does fall below this limit regularly. The 1000 l/s limit here has been successful in retaining good healthy flows in this creek for several decades.</p> <p>The recordings available at Timbervard Road are more complete but still only for a short time period (from 2007). These records show again that the flows are more uniform in their nature and have a gradual decreasing and increasing character. There have been considerable periods though when the stream has gone below the 1100 l/s limit but less so the 1000 l/s</p>

Stream	Variation Limit	Golders Limit	EISI Limit proposed	Type of Waterway	Number of Existing consents that CRC consider to have hydraulic connection	EISI Commentary
						on which farmers have based their irrigation systems. While the 1100 l/s limit is more realistic than other limits suggested for other streams in Variation 1, there is still concern that this increased limit will significantly hinder farming activity and reduce the reliability of existing farming systems further. It is also noted that many of the existing surface water takes are no longer used but are still active. They are no longer used because the consent review resulted in a change to many irrigation systems in the area which meant that water was sourced from deeper wells and no longer required the more laborious operation associated with diesel pumped surface water systems. Of the six surface water takes still active, at least three are known to be almost never used now.
Irwell River (at Lake Road)	890	637	300	Connected to Selwyn River flows and with minor spring system close to Lake Ellesmere. The Irwell River runs from the Selwyn River and flows to Lake Ellesmere/Te Waihora. Its flow is determined by what is happening in the Selwyn River which begins near the Alps – its flow being determined by weather events in the divide. Because of this the flow in the Irwell River fluctuates considerably over a year and between years. It is very much dependent on the westerly	Three groundwater takes: CRC001750 expires 2039; CRC010588 expires 2035; and CRC151739 expires 2035. One surface water take: CRC970542 expires 2032.	Because of the type of river system that the Irwell is connected to it makes it very difficult to determine a minimum flow limit that is suitable. For many years the Irwell River has been going dry and for many years this has occurred before the irrigation season has started in this area. For example, in 2005 the Irwell ran dry for most of the year right through until flows started to appear again in July 2006 ²³ . As irrigation in the immediate vicinity of this river only occurs predominantly from November to mid-March it is therefore inappropriate to attribute all the blame directly to irrigators that have been deemed stream depleters here as being the cause of the low flows. The variable flows are due mainly to weather conditions, rainfall in the Selwyn River headwaters, and to a lesser extent cumulative irrigation effects. It is also noted that there are only three groundwater take consents that remain with a perceived hydraulic

²³ Taken from CRC Flow Recording Data for Irwell River 1970 to present

Stream	Variation Limit	Golders Limit	EISI Limit proposed	Type of Waterway	Number of Existing consents that CRC consider to have hydraulic connection	EISI Commentary
				flows and the rainfall associated with that system.		<p>connection to the Irwell River that have restrictive minimum flow conditions on them and aquifer testing would likely prove that these wells are having an extremely minor effect on the river.</p> <p>Given the limited number of takes associated with this river and the variability of the river flow there seems little value in attributing such a high minimum flow level here. There is no uniformity to its flow at all and if the flow limit was set with the intention of having 890 m/s flowing in it for the summer there would be major problems with trying to farm arable crops in this area in the future. This would be because such a level would occur if there was major water mounding caused by augmentation or the CPW Scheme.</p> <p>Keeping the minimum flow level at 300 m/s will still retain the integrity of the river. By having a significantly higher minimum flow level provides an inappropriate assumption that this is what the stream should be flowing at all during the summer. This could well be unachievable and more than likely to never be achieved in the future. Since records began in 1970 there have been only seven flow recordings in January in any one year that have been above 890 m/s. These recordings were no doubt related to high westerly rainfall in the divide that then flowed down the Selwyn into the Irwell, and noticeably only two of those readings were on or before 1986 when irrigation would have been far less prevalent than now.</p> <p>On this basis it is considered that the level should remain at 300 m/s. There is no threat that retaining the existing level will give rise to a potential of new consent applications wanting shallow wells with</p>

Stream	Variation Limit	Golders Limit	EISI Limit proposed	Type of Waterway	Number of Existing consents that CRC consider to have hydraulic connection	EISI Commentary
						connections to streams. These are nearly impossible to obtain from the CRC without considerable restriction and are not economically viable to pursue when the alternative of deeper less connected wells would be a more sound investment under current regulations.
Lee River (Temoana)	70 % 7 D M A L F - 935	655	700	The Lee River begins near the southern edge of Southbridge Township. It is a spring fed stream but is very much influenced by the underground flows of water 'lost' from the Rakaia River system and in particular the flows of the northern branch of that river. The Lee has always been a very healthy stream with a significant level of natives growing along its banks.	One groundwater take: CRC010870 expires 2035.	The proposed Variation limit is substantially higher than the current limit or that limit proposed by Golders. The latter are sensible limits that will retain the ecological sustainability of the stream as well as provide reliability for the groundwater user. As noted previously the affected consent is within close proximity of where the aquifer testing was done that proved the over estimation of stream depletion effects in the area. The consent relevant to this stream is of a similar depth and use rate to those that were proven to have either negligible or very minor effects on the stream. It is also inappropriate to raise this level beyond that that is required to sustain ecological sustainability.
Selwyn River (at Coes Ford)	1200	893	600	Foothills fed large river. As mentioned previously the Selwyn River flow is determined by weather events in the divide. Because of this the flow can fluctuate considerably over a year and between years. It is very much dependent on the westerly flows and the rainfall associated with that system. For a considerable time the flows in the Selwyn at Coes Ford have been below the 1200 l/s limit. When recording began in 1984 the	Seven groundwater takes: CRC010991 expires 2035; CRC011437 expires 2019; CRC011914 expires 2040; CRC012057 expires 2038; CRC982147 expires 2033; CRC962277 expires 2031.	Variation 1 proposes doubling the minimum flow level that currently relates to existing consents. This is a major and substantial increase and would result in all those related consents becoming almost completely unreliable or potentially unusable in the future, particularly if they were to have this limit imposed prior to their expiry. It is noted that conditions of a resource consent cannot be such that they would render the consent unusable. Changing to the level proposed would have a significant financial impact on those operating under these consents. The costs associated with the loss of production due to no irrigation and the ability to 'finish' crops will result in no income. It is not a case of how much of a reduction in income would there

Stream	Variation Limit	Golders Limit	EISI Limit proposed	Type of Waterway	Number of Existing consents that CRC consider to have hydraulic connection	EISI Commentary
				<p>flows then were not above 1200 l/s in May and this was a time when irrigation was really only in an establishment phase for smaller scale dairying units.</p> <p>Records show that there have been a number of years when the winter flows have been well below the 1200 l/s limit i.e. July 1985 had flows in the 500 l/s range. Generally the Selwyn can be observed as being highly influenced by westerly rain in the ranges which often floods the lower reaches during spring periods or other times when other weather systems cause high rainfall in the alps.</p>	<p>Three surface water take consents:</p> <p>CRC961485 expires 2031; CRC990223 expires 2033; and CRC930620 expires 2028.</p>	<p>be? It is more a case of there being little production at all and therefore the inability to make a farm viable to operate.</p>
Retain Variation 1 Limits						
Stream/River	Variation 1 Limit l/s	EISI Commentary				
Selwyn River (at Whitecliffs)	550	The Society supports this limit as it is consistent with what is already imposed as conditions on existing consents and can be managed on the relevant farms appropriately and with a high degree of reliability for irrigation purposes.				
Jollies Brook (at sea outlet) 360	360	The Society supports this limit as it is consistent with what is already imposed as conditions on existing consents and can be managed on the relevant farms appropriately and with a high degree of reliability for irrigation purposes.				
Taumutu Creek and Waikekewai Creek	No abstraction after 1 July 2025 on consent expiry	No abstraction after 1 July 2025 on consent expiry as per the joint position statement agreement reached between Environment Canterbury, the Ellesmere Irrigation Society and Te Taumutu Runanga and as stated in the ZIP Addendum.				

Stream	Variation Limit	Golders Limit	EISI Limit proposed	Type of Waterway	Number of Existing consents that CRC consider to have hydraulic connection	EISI Commentary
Delete all references to:						
<p>Hanmer Road Drain and the row relating to it;</p> <p>Unnamed Drain at Prendergast property – tributary of Irwell River and the row relating to it;</p>				<p>These two drains were developed specifically to go dry as they are drains and were not intended to be life supporting mechanisms. They were developed to drain the water table as it rises from beneath in times when there is increased water in the underground aquifers. The Society has always opposed the implementation of minimum flow conditions on consents in the vicinity of these drains because they are not natural waterways and were specifically designed to go dry during summer months. If they were to contain flows or increased flows during summer months then this would ultimately mean that the land in the area was unnaturally wetter during crucial harvesting and crop drying months. This would cause crops to not reach their specified humidity levels that they need to obtain before harvesting and potentially the inability to access crops due to over wet conditions for heavy harvesting vehicles.</p> <p>In addition, the current flow limits on consents relating to the Hanmer Road Drain have a minimum flow limit of 100 l/s. The Variation proposes a new limit of 250 l/s which would more than likely render the relevant consents unusable.</p> <p>The unnamed drain at the Prendergast property was not a drain that was consulted on with parties in the Ellesmere area therefore it is unknown whether an ecological assessment has been done on this drain. There was no reporting of such an assessment during the consultation meeting at Southbridge and there was no mention of this drain in the information provided. Therefore it is a little surprising to now find it too has a minimum flow limit attributed to it.</p>		
<p>Irwell River (at Leeston Christchurch Road) and the row relating to it;</p> <p>Tent Burn Stream and row relating to it.</p>				<p>This location on the Irwell River is listed in the information from the CRC consultation as ‘not assessed’ for ecological limit or cultural limit. Therefore it is inappropriate to set any limit on this part of the River without these assessments having been done or taking into account the potentially affected parties.</p> <p>There are currently no minimum flow limits on the Tent Burn and this is largely because of the existence of a large salmon farming operation at the end of the stream where it meets the sea. The information provided to the Society at the consultation meeting indicated that there had not been an ecological assessment undertaken to determine the appropriate limit for the stream but a 200 l/s cultural limit had been suggested. Without an ecological assessment having been undertaken it is inappropriate to attribute any minimum flow level at present and given that there are few records of flows for this creek it is inappropriate to set any type of level at this time. Of the 13 flow records taken between 2001 and 2006 there were recordings taken at less than 200 l/s.</p>		

4.6.6 In summary the proposed Variation 1 minimum flow limits and the change to their timing of implementation recommended by the Reporting Officer are considered inappropriate for the following reasons:

- The timing relies heavily on the Central Plains Water Scheme being able to deliver increased flows in these streams before 2025 when this may or may not eventuate or there might be timing delays;
- If imposed in 2025, this would result in water take consents being practically and legally unusable, and result in substantially or completely unreliable irrigation water supplies;
- Significant changes to on-farm irrigation systems having to be made again soon after the completion of the Rakaia Selwyn Groundwater Consent Review which had already resulted in significant on-farm changes to systems at a substantial cost;
- A small number of farmers paying the price for effects on the streams that are a result of the entire zone's weather events and cumulative water use.

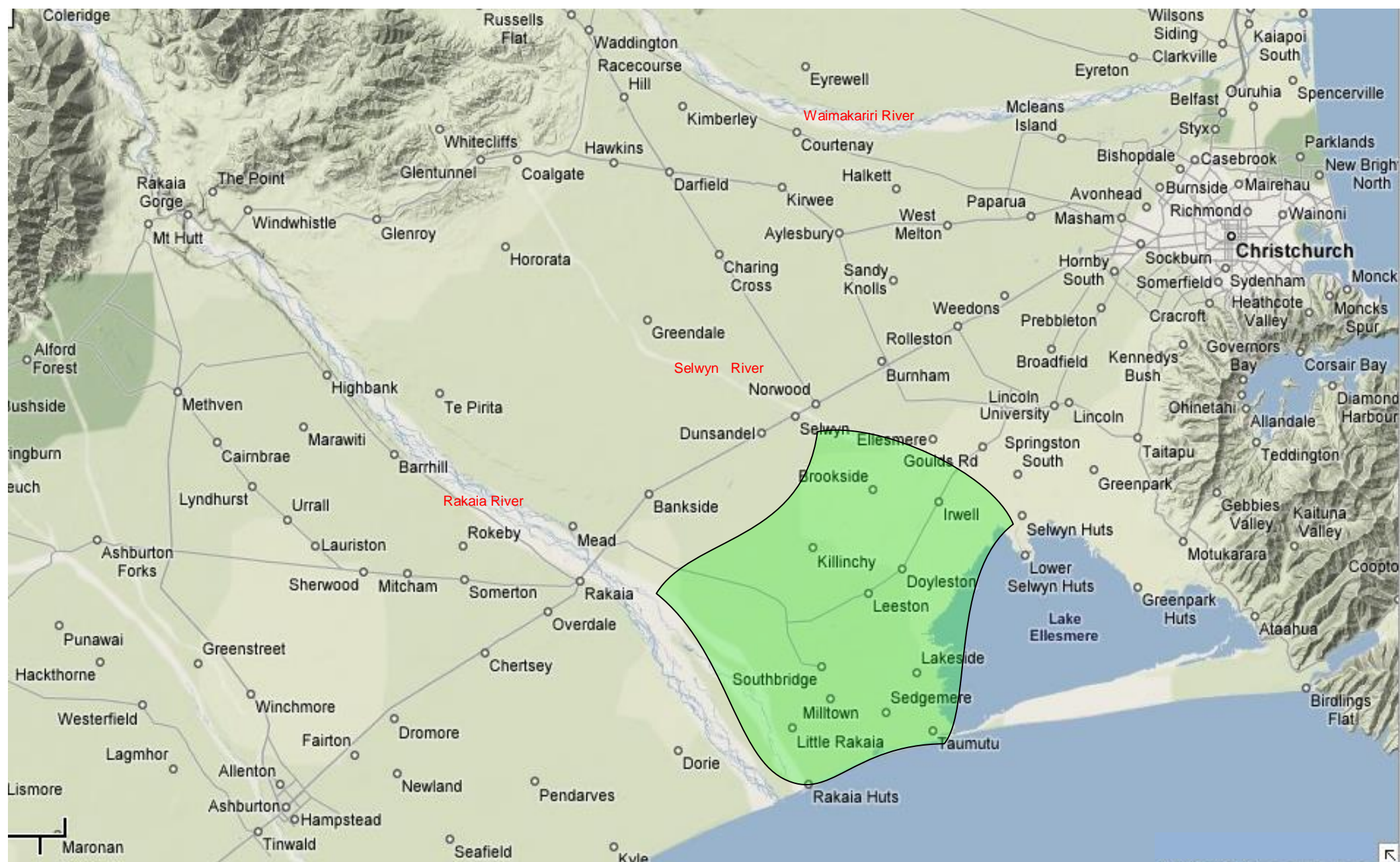
Ellesmere Irrigation Society Incorporated

2 October 2014

ANNEXURE A

ELLESMERE IRRIGATION SOCIETY INC.

MEMBERSHIP AREA



ANNEXURE B

SELWYN DISTRICT PLAN - PLANNING MAPS

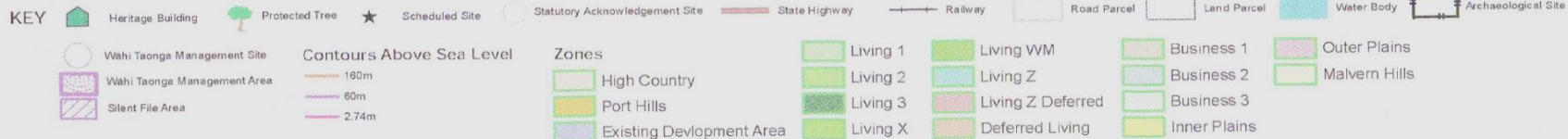
TANGATA WHENUA SITES OF SIGNIFICANCE



KEY

Heritage Building	Protected Tree	Scheduled Site	Statutory Acknowledgement Site	State Highway	Railway	Road Parcel	Land Parcel	Water Body	Archaeological Site																				
Wahi Taonga Management Site	Wahi Taonga Management Area	Silent File Area	Contours Above Sea Level 160m 60m 2.74m																										
Zones <table border="0"> <tr> <td> High Country</td> <td> Living 1</td> <td> Living WM</td> <td> Business 1</td> <td> Outer Plains</td> </tr> <tr> <td> Port Hills</td> <td> Living 2</td> <td> Living Z</td> <td> Business 2</td> <td> Malvern Hills</td> </tr> <tr> <td> Existing Development Area</td> <td> Living 3</td> <td> Living Z Deferred</td> <td> Business 3</td> <td></td> </tr> <tr> <td></td> <td> Living X</td> <td> Deferred Living</td> <td> Inner Plains</td> <td></td> </tr> </table>										High Country	Living 1	Living WM	Business 1	Outer Plains	Port Hills	Living 2	Living Z	Business 2	Malvern Hills	Existing Development Area	Living 3	Living Z Deferred	Business 3			Living X	Deferred Living	Inner Plains	
High Country	Living 1	Living WM	Business 1	Outer Plains																									
Port Hills	Living 2	Living Z	Business 2	Malvern Hills																									
Existing Development Area	Living 3	Living Z Deferred	Business 3																										
	Living X	Deferred Living	Inner Plains																										





MAP
008
SHEET 2

Printed on: Monday, 24 March 2014

ANNEXURE C

WAIKEKEWAI STREAM FLOW LOCATION





Photograph 1: Paddock where topographic map shows flowing Waikekewai Stream. Minor undulation of land visible with no water flow or banks. View is looking south to coast.



Photograph 2: Paddock where topographic map shows flowing Waikekewai Stream. Minor undulation of land visible with no water flow or banks. View is looking south to coast.



Photograph 3: Paddock where topographic map shows flowing Waikewai Stream. Minor undulation of land visible with no water flow or banks. View is looking south to coast.



Photograph 4: Paddock area where topographic map shows flowing Waikewai Stream. Undulation of land visible with significant aged planting adjacent. View is looking south-east to coast.



Photograph: Immediately up-gradient of where the flowing point of Waikekewai Stream is located.

ANNEXURE D

AQUIFER TEST INFORMATION

- 1 The following provides information regarding the inaccuracy of desk top modelled aquifer data compared to data modelled from actual aquifer testing. This information was previously presented at the hearing of the EISI submissions on the PLWRP and relates to concerns over what is included in Schedules 9 and 12 of the PLWRP. The Society is aware that the decisions on these submissions has now been made, however, the information below does assist in providing background to the inaccuracies associated with desktop modelling of aquifer characteristics.

SUBMISSIONS ON SCHEDULES

Schedule 9 of PLWRP – Assessment of Stream Depletion Effect

- 2 This Schedule is intended to instruct the determination of the degree of impact that a groundwater abstraction has on streams. Several consent holders that are members of the Society had their existing groundwater take consents reviewed by the CRC recently (2007 to 2010). Twenty six consents resulted in having some or all of their bores restricted by stream depletion conditions based on desktop assessments undertaken by CRC staff. These assessments were undertaken using modelled information that included data which was not taken from relevant or recent aquifer testing in the areas in which the bores existed. The CRC did not do any aquifer testing of its own to determine whether the information being put into the various assessment models was appropriate. Because of this the results did not realistically reflect what was actually happening physically in the various locations where the subject bores were. What resulted was the assessment of stream depletion effects that over-estimated the degree of effect by some considerable proportion. Consequently a large number of consents were proposed to have very restrictive stream depletion conditions attached to them, for example that a bore cease being used when the flow in the nearest stream fell below its minimum flow level. In some cases this meant that before the irrigation season commenced in the area the farmer was already unable to use their irrigation system. This was because the stream had already fallen below its minimum flow level before the irrigation season had started here. Quite obviously the problem with the stream flow was being caused by the cumulative effects of the large water users upstream (upper plains) on the lighter soils with the highly intensive land uses; their actual irrigation season starting approximately six weeks prior to the season in the Ellesmere area (down plains).
- 3 The consent holders appealed the decision of the CRC on the reviewed consents. During the negotiations throughout the appeal one consent holder provided information from actual aquifer tests on their property relating to all of their fourteen wells. All these wells were considered to be stream depleting to either a direct, high or moderate degree. However, when actual aquifer test results were provided by the consent holder it was found that 11 of the wells that were considered 'stream depleting' by the CRC were not having an effect beyond the threshold for which any conditions of irrigation restriction were required. In simple terms this meant that the modelled desktop data used by the CRC was vastly different to what was actually happening in reality. The table below illustrates the difference between what was modelled using estimated and untested information as used by the CRC and actual information when derived from 'real' tested aquifer information:

Stream Depletion/Spring Depression Analyses relating to Spring M37/0425		
	CRC's Estimated Value of Stream Depletion/Spring Depression Assumed T= 10 000 m ² /d Storativity = 0.0001 No Leakage Analysis: Theis	Actual Value of Stream Depletion/Spring Depression based on Aquifer Testing using Bowden Environmental Assessment Assumed T= 15 000 m ² /d Storativity = 0.0005 Leakage = 700m Analysis: Hantush, and Hunt as these models were more appropriate to use for the assessment.
Well M37/0293, distance to spring 88.2m		
Q7 pumping rate (l/s)	63	60.4
Q150 pumping rate (l/s)	32	32
Q7 add (m)	0.529	0.122 – 0.16
Q150 add (m)	0.336	0.065 – 0.12
Well M37/0468, distance to spring 95m		
Q7 pumping rate (l/s)	50	50
Q150 pumping rate (l/s)	25	25
Q7 add (m)	0.415	0.049 – 0.13
Q150 add (m)	0.26	0.098 – 0.10
Well M37/0326, distance to spring 298.5m		
Q7 pumping rate (l/s)	41.5	39.8
Q150 pumping rate (l/s)	21	21
Q7 add (m)	0.279	0.039 – 0.06
Q150 add (m)	0.185	0.020 – 0.06
Well M37/0327, distance to spring 451.8m		
Q7 pumping rate (l/s)	41.5	39.8
Q150 pumping rate (l/s)	21	21
Q7 add (m)	0.255	0.026 – 0.05
Q150 add (m)	0.173	0.014 – 0.05
Well M37/0477, distance to spring 496m		
Q7 pumping rate (l/s)	50	50
Q150 pumping rate (l/s)	25	25
Q7 add (m)	0.301	0.030 – 0.05
Q150 add (m)	0.203	0.015 – 0.02
Well M37/0467, distance to spring 898m		
Q7 pumping rate (l/s)	71	71
Q150 pumping rate (l/s)	37	37
Q7 add (m)	0.37	0.019 – 0.04
Q150 add (m)	0.271	0.010 – 0.02
Well M37/0466, distance to spring 1348m		
Q7 pumping rate (l/s)	50	50
Q150 pumping rate (l/s)	25	25
Q7 add (m)	0.233	0.003 – 0.02
Q150 add (m)	0.169	0.006 – 0.04
Well M37/0476, distance to spring 1490m		
Q7 pumping rate (l/s)	50	50
Q150 pumping rate (l/s)	25	25
Q7 add (m)	0.226	0.004 – 0.02
Q150 add (m)	0.165	0.002 – 0.03
Well M37/0475, distance to spring 1710m		
Q7 pumping rate (l/s)	50	50
Q150 pumping rate (l/s)	25	25
Q7 add (m)	0.216	0.002 – 0.01
Q7 add (m)	0.161	0.003 – 0.03

4 It is clear from the above example that the values produced by the CRC grossly over estimate stream depletion effects. The discrepancies shown are:

- The use of the Theis distance and drawdown curves as used by the CRC was not appropriate and totally over-estimated the head depression (drawdown effect on springs);
- The data obtained from aquifer testing and then analysed showed that these wells were well under the 0.1m cut-off threshold which was chosen by the CRC as indicating 'significant' or more than minor effect on stream flows;
- The use of desktop modelling without 'real' and accurate data caused massive over estimation of stream depletion effects.¹

This illustrates the problems associated with Schedule 9 in that the way in which these effects are assessed is subject to the insertion of values within a model that are not explained or even addressed here. Throughout the review and appeal process the CRC staff constantly changed their minds and methods of stream depletion effects assessment which gave no certainty to anyone and resulted in a complete loss of confidence in work done by staff and the accuracy of their processing of data, and ultimately the need to impose severe restriction conditions.

5 It is the Society's view that until real tested knowledge is available about the groundwater systems in the various catchments, it is entirely inappropriate to contemplate the imposition of conditions of consent that relate to stream depletion effects. To impose conditions on consents that effectively make the consent unusable is contrary to the provisions of the Resource Management Act and comes at a significant financial and economic cost to the consent holder. This is particularly the case when such conditions are imposed on existing consents.

6 If a bore's use is modelled using incorrect data, it can result in a farmer having to stop irrigating all together when the stream that the bore is considered to have a hydraulic connection to drops below the minimum flow level. As an example, in the case of farmer's in the Lakeside area that were close to Harts Creek, this meant that they were prevented from irrigating when the Creek went below its 1000 l/s minimum flow limit. In average to dry years this creek may start flowing below the 1000 l/s before irrigation has commenced in this area i.e. November. Therefore any impact on the lowering of the stream flow has already been caused by either natural physical events or the over allocation of water in the upper plains. To penalise the farmers adjacent to the stream when the adverse effect has occurred as a result of over allocation by the consent authority is inappropriately shifting the blame. There is little evidence in the Ellesmere area that shows that any reduction in flows of the streams is caused by the adjacent farmers, particularly given that aquifer testing has proven that there are very few wells in the area that are likely to be actually be having any significant effect on these stream flows. The example above is derived from one of the largest land holdings in the Ellesmere area and it is shown to be only having a minor impact over only three of its wells.

7 What became obvious throughout the process was that there were so many different ways to interpret the assessment of stream depletion effects that it left you wondering how it was possible to impose such restrictive conditions when there was little agreement between those assessing the data. Where such differences in assessment apply it would seem inappropriate to apply conditions of consent until such time that more accurate knowledge was available in relation to these types of effects and the nature of the specific catchments. We understand that still no further aquifer testing has been undertaken by the CRC since this review.

Schedule 12 – Well Interference Effects

8 The Society shares similar concerns about Schedule 12 as to those relating to Schedule 9. This is because the level of drawdown impact is usually based on desk top analysis using information and modelled values that are not appropriate; again over estimating the level of effect. Where these effects are over estimated they result in not only an exaggeration of the drawdown impact, but also they trigger the need to seek

¹ 'Constant Discharge Aquifer Test M37/0326, Mr & Mrs LG & VM McMillan June 2010', Bowden Environmental

written approvals from a large number of 'potentially' affected parties when a new water take or change of conditions to an existing consent is being applied for.

- 9 The distance of a 2km influence zone is also considered overstated in the Ellesmere area. Under this distance and in-conjunction with the over-estimation of the effects of the drawdown, applicants are being asked to seek written approvals from potentially adversely affected parties that are not only considerable in number but also who are not likely to experience any adverse effect at all from the proposed activity.
- 10 The table below illustrates actual drawdown information and what is produced using real tested data. It is clear from this table that there is a considerable over estimation of the impact using ECan desktop modelled data that suggests that there are impacts over 0.1m at a distance up to 2km from a well. The table shows that the 0.1m drawdown impact was not reached at distances beyond 450m.

Drawdown Calculated from Pump Tests					
Aquifer Test Bores	Average Pumping Rate (L/s)	Drawdown at 500m (m)	Drawdown at 1000m (m)	Drawdown at 2000m (m)	Distance at which drawdown = 0.1m (0.1m being the threshold as specified in point 2. of Schedule 12)
M37/0242	80	0.08	0.03	0.01	365
M37/0076	140	0.05	0.02	0.004	230
M37/0277	140	0.05	0.02	0.002	260
M37/0342	55	0.035	0.015	0.003	95
M37/0031	55	0.030	0.009	0.001	125
M37/0616	55	0.096	0.065	0.037	450

2

ANNEXURE E

COST SUMMARY OF IRRIGATION REDEVELOPMENT

AS A RESULT OF

RAKAIA SELWYN GROUNDWATER CONSENT REVIEW

ACTUAL 'DEEP WELL' COSTINGS

ELLESMERE IRRIGATION SOCIETY INC.

15 June 2010

The following table sets out the actual costs associated with putting one new well down to a depth of 96m. Several new wells may be required on a property. Note: Since this costing was done in 2010 there has been an increase in pricing of approximately 15 to 20% across the board and in some cases, for example fencing prices, the price has increased by more than 30%.

Contractor / Activity	Costing	Sub-total (GST exclusive)
Consultancy Fees – resource consent application/ change of conditions application to water take consent and new bore consent	\$15,000.00	
Environment Canterbury application processing deposits and fees	\$5,000.00	
Well Development – McMillan Well Drilling Limited	\$51,066.25	
Electricity connection fee – Orion –access to power	\$10,054.00	
Electricity physical connection - Lemacon	\$25,240.00	
		\$106,360.25
Development of pump station – Waterdynamics – Pump Headworks Variable Speed Drive and Filter	\$43,983.33 \$27,570.83 \$43,645.00	
		\$115,199.16
Irrigation System – 540m and C A Pivot Mainline, fitting and Installation Power and Electrics	\$240,785.81 \$27,424.25 \$14,822.00	
		\$283,032.06 with new pivot \$42,246.25 using existing irrigator i.e. Briggs, Gun.
Irrigation System – 310m Towable Pivot Mainline, Fittings and Installation Power and Electrics	\$141,554.61 \$53,367.34 \$32,077.43	
		\$226,999.38
Re-fencing	\$40,000.00	
Culverts	\$20,000.00	
General Excavation	\$20,000.00	
		\$80,000.00
TOTAL for New Deep Well and New Pivot System (excluding GST)		\$811,590.85
TOTAL for New Deep Well and New Pivot System (including 15% GST)		\$933,329.47 (One new well only)
TOTAL for New Deep Well only (excluding GST)		\$263,805.66
TOTAL for New Deep Well only (including 15% GST)		\$303,376.50

Denotes costs associated with simple well deepening – no new irrigator system included

Denotes costs associated with one deep well, new underground piping and two pivot system

ANNEXURE E

WATERWAY FLOW RECORDS