

**IN THE MATTER OF** the Resource Management Act  
1991

**AND**

**IN THE MATTER OF** applications by Central Plains  
Water Trust to:

Canterbury Regional Council for  
resource consents to take and  
use water from the Waimakariri  
and Rakaia Rivers and for all  
associated consents required for  
the construction and operation of  
the Central Plains Water  
Enhancement Scheme

Selwyn District Council for  
resource consents to construct  
and operate the Central Plains  
Water Enhancement Scheme

**AND**

**IN THE MATTER OF** a notice of requirement by  
Central Plains Water Limited to:

Selwyn District Council for the  
designation of land for works  
associated with the construction  
and operation of the Central  
Plains Water Enhancement  
Scheme

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**BRIEF OF EVIDENCE OF SUSAN ROBSON**

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## 1. **INTRODUCTION**

- 1.1. My name is Susan Robson and I am a consultant resource management planner and a director of Robson Garland Limited. I have a BSc and an MSc in Resource Management and am a member of the New Zealand Planning Institute. I have twenty-five years of experience in resource management both in Australia and New Zealand.
- 1.2. My resource management experience includes work on a number of water and soil resource management planning projects. In particular, I was involved with the Assessment of Effects on the Environment for the Balmoral Irrigation Scheme and the Lower Rakaia/Central Plains Irrigation Schemes which were the last large-scale Ministry of Works sponsored irrigation schemes that were proposed in the late 1970s. The Central Plains component of this later joint scheme was a pre-cursor to the current scheme, albeit in a very different format, and the Lower Rakaia component proceeded but largely through individual groundwater abstraction instead of via a community scheme as originally proposed.
- 1.3. Although this experience occurred over 20 years ago and the statutory requirements and processes have changed significantly, the environmental issues are much the same. There are now two different issues:
- twenty five years ago dairying was not envisaged on the Canterbury Plains; and
  - storage was not part of the earlier Lower Rakaia/Central Plains schemes.
- 1.4. More recently I was involved peripherally with Project Aqua as I was engaged to peer review the S42A officer reports, but the project was abandoned before the reports were prepared.
- 1.5. I am familiar with the Proposed Selwyn District Plan, both from my day-to-day work as a consultant in Christchurch, but also because I acted as a Commissioner in the hearings on submissions on the following issues:

- Waterbodies;
- Indigenous Vegetation;
- Outstanding Natural Features and Landscapes; and
- Tree Planting.

Of these four topics, the first two are especially relevant to this hearing while outstanding natural features and landscapes has limited relevance as I shall explain later in this evidence.

1.6 In writing this evidence I rely on the expert evidence of the witnesses before me and where appropriate I will refer to the evidence that is relevant when I am discussing the effects of the Scheme in terms of the objective and policy framework of the Regional Policy Statement and Proposed Selwyn District Plan.

1.7 I have read the code of conduct for expert witnesses set out in the Environment Court Code of Practice, and confirm that I have complied with the code in the preparation of my evidence.

## **2. SCOPE OF EVIDENCE**

2.1 Designation and resource consent applications are related and some are critical to others – in particular the designation application depends absolutely on the applications to take water from the Rakaia and Waimakariri at the three specified take points. The resource consent applications for matters such as the distribution network, the river crossings of the canal, etc are related, but not critical as alternative routes, locations and/or methods exist for those components of the Scheme.

2.2 My evidence focuses on the resource management planning issues relating to both the designation and the six land use resource consent applications made to Selwyn District Council for the distribution network. Mr Murray assesses the planning aspects of the applications to Environment

Canterbury. Other witnesses and the applicant's legal submissions have addressed the tests of section 171(1)(a)-(c) for the designation and section 104 for the land use consents. I shall concentrate on assessing the designation and land use applications in terms of the relevant provisions of the relevant policy and planning documents. By and large, the specialist witnesses describe the effects of the designation and the distribution network, both the construction and operational effects and I shall refer to these as necessary, focussing on the land use effects.

- 2.3 The applicant's legal submissions describe and discuss the statutory considerations in detail and I shall not set them out in full in this evidence. The introductory part of section 171(1) is prefaced by the words "Subject to Part II". As such, Part II matters must be considered first as they have the effect of overcoming any conflicting considerations arising out of section 171(a)-(d).
- 2.4 The legal submissions also address section 5 and how the "enabling" and "management" functions of section 5(2) are of equal importance, and between them the specialist witnesses have addressed both the enabling and positive effects of the project and its effects on the environment. The legal submissions also draw your attention to the relevant section 6, 7 and 8 matters.
- 2.5 The Regional Policy Statement (RPS) provides an overview of the resource management issues of the region. Regional plans, such as the Waimakariri River Regional Plan (WRRP) and the Proposed Natural Resources Regional Plan (PNRRP), must be consistent with the RPS. Similarly, the Proposed Selwyn District Plan (PSDP) must be consistent with the RPS.
- 2.6 The WRRP primarily relates to those components of the project relating to the taking of water from the Waimakariri River and activities within the bed of the Waimakariri. The parallel rules in the PNRRP which have effect over most of the Canterbury region do not apply over those parts of the project contained within the Waimakariri catchment. Mr Murray's evidence

discusses the key provisions of the WRRP. Similarly his evidence addresses the PNRRP insofar as it addresses the applications to Environment Canterbury for the taking, discharging and use of water through the project area (outside the area covered by the WRRP) and for activities within the Rakaia Riverbed.

2.7 My evidence therefore focuses on the relevant provisions of the RPS and the PSDP<sup>1</sup> as they relate to the Notice of Requirement for the main headrace, the Upper Waimakariri intake and tunnel, and the Waianiwaniwa Dam and Reservoir plus all of the resource consent applications for the distribution network. For the sake of completeness, I will also address the headworks in the rivers but note that there will be some inevitable duplication here with Mr Murray as the bed of the river in braided rivers is difficult to define with precision.

### **3. THE APPLICATIONS**

3.1 The Notice of Requirement (NOR) covers the land use component of the Scheme where the designation is sought. In effect it imposes a footprint on the ground authorising the works necessary for the Scheme and in particular:

- The headworks at all three river intakes,
- The headrace canal, and
- The dam and the storage reservoir in the Waianiwaniwa valley.

3.2 For those scheme components covered by the NOR, the designation replaces the district plan rules with specifications and conditions within the designation. I consider that a designation is the appropriate tool to provide for the key components of the Scheme as as opposed to a resource consent, or what inevitably would be a set of resource consents for a project such as the Central Plains. A designation provides a greater degree of flexibility for an applicant as detailed designs and subsequent

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<sup>1</sup> The Transitional Selwyn District Plan does not need addressing as all of its objectives and policies are beyond challenge, Julia Forsyth, Selwyn District Council.

construction works are able to occur on an as required basis, following the lodgement of an outline plan in accordance with section 176A of the Resource Management Act.

3.3 Once imposed, a designation protects the project which is the subject of the designation from incompatible land uses and activities. Pursuant to section 176 of the Resource Management Act, the consent of the requiring authority is necessary to do anything in relation to the land which would prevent or hinder the project. The other key distinguishing feature of the designation is that, once designated, land can be acquired under the Public Works Act 1981. I believe it is appropriate, that requiring authorities have the ability to apply to the Minister for Lands to acquire the designated land so that they may implement the designated works. Firstly, it is consistent with the effective control they are given over the use of the land by virtue of section 176. Secondly, it is consistent with the fact that a designation is a recognition that use of the designated land is reasonably necessary for achieving the objectives of the public work, project or work, including in light of the requiring authority's consideration of alternative sites or routes.

3.3 The distribution network is not the subject of the designation, however. The water distribution network takes the water from the headrace via a network of canals and pipelines, with ancillary buildings and structures over six geographical areas of Canterbury:

- Springfield
- Sheffield,
- Darfield,
- Central
- Te Pirita, and
- Windwhistle.

3.4 Details of the NOR components of the scheme and the water distribution network are set out in the applications and in the evidence of others (especially Mr Tipler and Mr Lewthwaite) so I shall not repeat them here.

- 3.5 Under the PSDP, resource consent is required for the construction and operation of the distribution network and its ancillary components as a (fully) discretionary activity. This is primarily due to the volume and/or location of earthworks required for the construction of the waterway channels and the breach of relevant performance standards applicable to utilities or utility buildings and structures. This is because the proposed water distribution network falls within the Plan's definition of "utility", while the ancillary structures meet the definitions for "utility building" and "utility structure". Under the Malvern Section of the Transitional District Plan, resource consent is required for the excavation necessary for the construction of the distribution network as a conditional use (now a discretionary activity under the Resource Management Act 1991).
- 3.6 I emphasise that by seeking resource consent for the distribution network (as opposed to a designation), land owner agreement will still be required prior to the commencement of any works. This will require further consultation and negotiation with individual landowners about any particular requirements they may have in regards to the construction and operation of the network (e.g., access arrangements, stock control, race positioning/relocation, etc) and reimbursement for the loss of any land. Accordingly, it is anticipated that almost all site-specific concerns of landowners will be resolved before the right to access the land to commence work is secured by the applicant. Given the consequential refinements to the route of the network which will be required, it is inevitable that further consents and or changes of consent conditions will be necessary. Notwithstanding, the network as currently proposed represents a feasible layout for which consent can be assessed and obtained, for subsequent refinement and ultimately construction. It also reflects a number of changes which have been made through the consultation process to date in order to address landowners' concerns.
- 3.7 It is appropriate at this stage of my evidence to discuss the approach that has been taken in the conditions that are volunteered as mitigation

measures in the applications. It is apparent that these conditions place a large degree of reliance on management plans, the details of which have still to be finalised. Imposing conditions which rely on the development of management plans is an accepted and commonly used way of ensuring that consent conditions will achieve the desired level of mitigation of the identified environmental effects, while allowing them the ability to adapt to any changes in circumstances which may occur after the grant of consents.

3.81 In a project of such magnitude as the Central Plains Water Enhancement Scheme it is not practicable for all the details of the Scheme components to be finalised at the consenting stage; similarly the construction methodology will only be finalised at the time of tender. Furthermore, there is likely to be a considerable passage of time between when consents are granted and when they are implemented, which can have implications for how the effects are most appropriately managed. As far as possible at this stage the conditions specify absolute limits and/or environmental outcomes to be achieved and then require that management plans be prepared to achieve the absolute outcomes set out in the conditions. For example there are conditions specifying absolute limits for construction noise; then the conditions require a management plan that sets out procedures to be adopted to achieve those limits. Similarly the conditions specify that monitoring is to occur and that the management plan should include the procedures to be followed in the case of complaints.

3.9 Adaptive management plans allow the applicant to incorporate new techniques and technology for better managing effects and to refine the way it mitigates effects accordingly. I consider that this two tiered structure of conditions, and the use of management plans to ensure specified outcomes are achieved, is appropriate for a project of the scale of the Central Plains Water Enhancement Scheme.

## **4. THE REGIONAL POLICY STATEMENT**

### **Tangata Whenua (Chapters 5 and 6)**

- 4.1 Chapter 5 of the RPS, prepared by Tangata Whenua, sets out matters of resource management significance to Tangata Whenua as identified with runanga. It contains a table (Table 2) which cross references the outcomes and measures sought by Tangata Whenua to the relevant objectives, policies and methods set out in Chapters 6-18 which contain the objectives and policies of the Regional Council.
- 4.2 The following outcomes sought by Tangata Whenua are especially relevant to both the NOR and land use applications for the Central Plains Project:
- Consultation.
  - Protection of mahinga kai
  - Protection and enhancement of access to wahi tapu and waahi taonga for tangata whenua.
  - Obtain the concurrence of Tangata Whenua for use or access to information in relation to wahi tapu and waahi taonga.
  - Protection and enhancement of indigenous flora and fauna.
- 4.3 I note that there are a number of other outcomes sought in relation to water diversion and mixing which are fundamental to the project and these have been addressed by Daniel Murray
- 4.4 Chapter 6 sets out the Regional Council's objectives and policies to provide for the relationship of Tangata Whenua with resources. Those relevant to the Scheme (Objective 1, Policies 1, 3 and 4) are set out in Appendix 1, These are recognised and provided for in the PSDP and the decision on the NOR and land use applications will also have to recognise and provide for the relationship of Tangata Whenua, their culture and their traditions with ancestral lands, water, sites, wahi tapu and other taonga. I discuss the

issues raised for the Scheme by these objectives and policies in paragraphs 5.60 to 5.67 when I discuss the District Plan's cultural and heritage objectives and policies, as these are a little more specific.

- 4.5 The difficulty is that, as explained by Mr Habberfield-Short, the exact impacts of some key components of the Scheme (especially the Upper Waimakariri intake works and the main headrace) on identified archaeological sites are not known because access to previously documented sites has been denied or the site can no longer be located. In addition, there may be other, as yet unknown sites in the path of the Scheme. While some archaeological sites could be destroyed, there appears to be considerable potential for final design to avoid most of the sites identified as being at risk from the proposed works. Conditions are proposed, however, to address these issues by requiring the applicant to undertake additional surveys and obtain the necessary approvals from the NZHPT, and to fully record and document the sites to expand our understanding and knowledge base.

#### **Soils and Land Use Chapter 7)**

- 4.6 The relevant objectives and policies are Objective 1, Policies 2, 3 and 4 which concern life-supporting capacity and erosion, and Objective 3 which concerns contamination of land. I discuss issues relating to soil life-supporting capacity in paragraphs 5.6 to 5.14 and 5.52 to 5 53 when I assess the applicable District Plan objectives and policies. The key points are that irrigation increases the life-supporting capacity of farm land, and conditions requiring rehabilitation and re-vegetation of exposed soil will prevent erosion.

#### **Landscape, Ecology and Heritage (Chapter 8)**

- 4.7 Objectives 1-4 and their accompanying policies address protection and enhancement of wetlands, landscapes, indigenous vegetation and heritage respectively. The PSDP contains provisions to protect and enhance

wetland areas and values under Policy 1(a), to encourage artificial wetlands under Policy 2, to protect and enhance natural features and landscapes under Policy 3, and biological diversity under Policy 4 and heritage values under Policy 5. I discuss these issues in detail in paragraphs 5.60 to 5.67 when I assess the scheme in terms of the District Plan framework. With the possible exception of a limited number of effects on heritage values, I conclude that there is no inconsistency with either the RPS or the PSDP in respect of landscape, ecology and heritage.

## **Water (Chapter 9)**

4.8 Water allocation and quality issues are the focus of this chapter of the RPS. Mr Murray's evidence contains a detailed analysis of these in relation to the proposed Central Plains Scheme.

## **Beds of Rivers and Lakes and their Margins Chapter 10)**

4.9 The beds of rivers are the responsibility of Environment Canterbury, but for braided rivers it is difficult to know where the riverbed ends and the margin begins. Hence the issues on riverbed margins are the responsibility of both the District and the Regional Councils. As the three sets of headworks for the Scheme will be located in and beside the Rakaia and Waimakariri Rivers, their construction in particular presents issues in relation to matters such as:

- modification of riparian vegetation;
- disturbance of habitat;
- effects on recreation values
- weeds;
- effects on flood control works; and
- siltation.

4.10 Objective 1, Policies 1, 2 and 3; Objective 2, Policy 4; Objective 3, Policy 6; Objective 4, Policy 7 are relevant and I set these out in Appendix 1. Mr Murray discusses those objectives and policies which relate or to the

riverbed while I discuss issues of riparian vegetation and access for recreation in paragraphs 5.15 to 5.22 (indigenous vegetation) and 5.47 to 5.51 (community facilities and recreational areas). Overall I conclude that with the imposition of conditions requiring protection (where possible) and enhancement of indigenous riparian vegetation, revegetation of all exposed earthworks, and provision of alternative access to riverbeds where existing public access is impeded or blocked by construction activities, that the Scheme is consistent with the RPS.

## **Settlement and the Built Environment (Chapter 12)**

4.11 The RPS identifies the adverse environmental effects of both urban development and network utilities as issues. Hence, the objectives and policies in this chapter encapsulate all the most relevant matters for the Scheme as it is a network utility.

### **Objective 1**

*Enable urban development and the physical expansion of settlements and the use and provision of network utilities to occur while avoiding, remedying or mitigating adverse effects on the environment, including in particular effects on:*

- (a) uses and values associated with water quality of waterbodies.*
- (b) flow and level regimes of water bodies, including the flow regimes of spring-fed streams.*
- (c) air quality.*
- (d) natural character of coastal environments, wetlands, lake and river margins that meet the criteria of sub-chapter 20.4.*
- (e) natural features and landscapes that meet the criteria of sub-chapter 20.4.*
- (f) areas of significant indigenous and native vegetation and significant habitats of indigenous or native fauna including native fish, for example, inanga (whitebait), tuna (eel), including those that meet the criteria of sub-chapter 20.4.*

- (g) ancestral land, water, sites, wahi tapu, and wahi taonga of value to Tangata Whenua.*
- (h) amenity values that meet the criteria of sub-chapter 20.4.*
- (i) heritage values of sites, buildings, places and areas that meet the criteria of sub-chapter 20.4.*
- (j) recreational resources that meet the criteria of sub-chapter 20.4.*
- (k) energy use.*

4.12 The above objective and policy 2 (set out in Appendix 1) recognise that “network utility systems provide social and economic benefits to people and the requirements of an efficient and effective network utility system need to be considered when minimising adverse effects” (explanation to Policy 2). I interpret this as a re-statement of the balancing exercise required by section 5 of the Act. The significant point is that the RPS recognises the benefits of network utilities for society. At the same time, the adverse effects on the environment must be minimised. The proposed conditions which require mitigation and rehabilitation are designed to achieve the outcomes sought by the above objective and policy.

### **Air (Chapter 13)**

4.13 Construction of the Scheme will involve extensive earthworks and, in Canterbury’s windy environment, these have the potential to adversely affect the amenity of people living nearby through the emission of dust. Objective 2 and Policies 3 and 5 will be met through the imposition of conditions to avoid, remedy and mitigate the potential for adverse effects of dust emissions.

4.14 Conditions for the land use applications address dust. The avoidance of adverse effects due to dust is largely a matter of recognition of the issue so that contractors incorporate dust suppression techniques in their day-to-day work. A Dust Management Plan for contractors is among the requirements of the relevant dust conditions.

## **Energy (Chapter 14)**

4.15 As Mr Tipler and Mr Lewthwaite have explained, the Scheme has been designed to maximise the use of gravity. Specifically, the Scheme will use a tunnel from the upper Waimakariri intake to supply the reservoir by gravity rather than pumping, and will use gravity to reticulate the water around most of the Scheme area. In addition the Scheme will allow farmers to replace pumped water from deep groundwater bores with a surface supply., . This greatly reduces use of energy and cost, and is in accord with Objective 1 which seeks reduced dependence on non-sustainable energy sources. I understand that the proposal is seeking consents for open channels for the distribution network but as designs are finalised, pipelines may be used from place to place. This will not impact on the scope of the consents sought and the final design (pipe or channel) will depend largely of considerations of cost, including energy. Where pipes can be used this will assist in pressurising the system which will further reduce energy costs incurred by the farmer as explained in Mr Tipler's evidence.

## **Transport (Chapter 15)**

4.16 The headrace crosses State Highway 73 just below Racecourse Hill and crosses State Highway 77 at Coalgate. In addition, there are a large number of other road crossings both for the main headrace and the distribution network canals. The main headrace crosses the Midland railway line at Racecourse Hill. The Scheme can be constructed so that the railway remains open at all times as Mr Whaley has described. Similarly, all other road crossings will be built so the roads remain open, although there will be times when traffic has to use temporary diversions. Traffic management plans are required by the proposed conditions (Traffic management) for both the NOR and the land use consents, to set out ways of achieving the absolute requirements set out in the conditions. The details within the traffic management plans will only be able to be formulated once the Scheme design and methods of construction are finalised, often at the point of confirming contracts. The overall aim of the

condition is to ensure minimal disturbance to the road network and the protection of the railway line during the construction period.

- 4.17 Mr Whaley has described the effects on the road network that will result from the inundation of the Waianiwaniwa River and the cutting of a number of roads in the Waianiwaniwa Valley. Overall, the intention is to provide access to all properties in the valley at all times by constructing new roads. The construction of these is provided for in the NOR and will also be subject to conditions to avoid, remedy or mitigate adverse effects on the environment.
- 4.18 With the above provisions, the Scheme will be consistent with the relevant RPS objectives and policies for Transport (Objective 1, Policy 1; Objective 2, Policy 4).

### **Natural Hazards (Chapter 16)**

- 4.19 The Scheme has the potential to affect two potential areas of natural hazard:
- effects on flooding in the Rakaia and Waimakariri Rivers
  - effects of dam breach. Although this is not a natural hazard in itself, a natural hazard such as an earthquake could trigger a dam breach. In any case, the effects of a dam breach triggered by an extreme earthquake would be similar to the effects of a dam breach induced by human error.
- 4.20 Mr Lewthwaite has discussed the potential for river training works and effects on flooding in the Rakaia and Waimakariri Rivers. In assessing the RPS objectives and policy framework for natural hazards I am putting all effects of a possible breach of the Waianiwaniwa Dam into this category – even though clearly a dam breach could result from human error. Dam breach could also occur due to other natural hazards such as landslips or earthquake.

- 4.21 As the main headrace crosses gullies, some embankments will be up to 10m in height above the surrounding land. It will contain some built in design features to isolate sections so that any spill due to rupture will be contained. In addition, the operational plan will include an emergency action plan for events such as headrace rupture
- 4.22 The relevant RPS objectives and policies are Objective 1, Policy 3 and Policy 4. Notably policies 3 and 4 require taking a precautionary approach and this is highly relevant when considering the proposed Waianiwaniwa Dam which is an integral component of the Scheme. While Policy 3 gives priority to keeping assets away from danger, in this case it is the subject of the consent which provides a new source of danger (the dam) for an existing asset (Coalgate and other downstream residences and properties). I still consider that the policies are applicable, even though they have been written assuming it is the new asset which will be placed in the path of a hazard rather than a new structure presenting a risk by way of natural hazard to existing assets (residences and other downstream properties).
- 4.23 I discuss these issues in paragraphs 5.54 to 5.59 of my evidence where I assess the corresponding PSDP objectives and policies. At the end of the day, everything has a risk and the commissioners will have to be satisfied that the potential risk and associated costs of dam failure are far less than the benefits overall to Canterbury.

#### **Hazardous Substances; Solid and Hazardous Waste Management (Chapters 17 and 18)**

- 4.24 Small amounts of hazardous substances will be involved in the construction of the Scheme (eg, diesel, explosives, etc). It is also possible that the construction of the headrace could interfere with other facilities such as septic tanks, offal pits and the like.
- 4.25 Proposed Conditions 10 and (Waste Management and Hazardous Substance), for the NOR and land use applications respectively, require

remediation action plans to minimise the effects of possible contamination using measures such as avoiding potential sources of contaminants, building storage areas, treating contaminated water plus ongoing sampling and reporting. The specific measures taken can only be identified and provided for at the time of final design. Overall, I consider that the proposed set of conditions provide adequately for the issues of hazardous substances and solid waste management, and achieves the outcomes sought by the relevant RPS objectives and policies. (Hazardous substances Objective 1, Policy 2, Policy 3; Solid and Hazardous Management Objective 1, Policy 1, Policy 3 and Policy 4).

## **5. THE PROPOSED SELWYN DISTRICT PLAN**

- 5.1 There are no references on any relevant objectives or policies in the PSDP and accordingly I shall not discuss the Transitional District Plan.
- 5.2 The PSDP is an effects-based plan; its premise generally being that activities are permitted unless a rule provides otherwise. The plan makes specific provisions for “utilities”, the definition of which includes:
- “... the use of any structure, building or land for any of the following purposes*
- (d) The conveyance, storage, treatment or distribution of water for supply, including (but not limited to) irrigation and stockwater.”*
- 5.3 Thus the PSDP recognises that utilities have an important role in enabling people and society to provide for their wellbeing, and different rules apply to utilities in comparison to other activities such as buildings in general. In the context of the distribution network, the use of land for the proposed distribution network races falls within the PSDP definition of ‘*utility*’— being the use of land for distribution of water for supply. Similarly, the ancillary structures, buildings and uses of land associated with these races fall within the definition of ‘*utility building*’ and ‘*utility structure*’. The PSDP provides specific rules for utilities, in recognition of the role they play in enabling people and society to provide for their wellbeing. Also of relevance to the

distribution network are those provisions relating to the scale of earthworks permitted in the rural zone and their location (e.g., proximity to waahi taonga, flood areas, contaminated soils, etc).

5.4 The PSDP provides one rural zone, although different rules apply in different areas, for some activities. Thus, for example there are different rules for buildings on the plains, as opposed to on the Port Hills and in the High Country. Within the area classified as containing outstanding natural features or landscapes of the High Country, there are different rules again for some matters. It must be noted that none of the Central Plains Enhancement Scheme is located within an area recognised by the PSDP as being an outstanding landscape. The Malvern Hills area of the Rural zone contains the Waianiwaniwa Reservoir, dam and parts of the main headrace as it skirts the hills but there are no special rules for the Malvern Hills which would apply to the Scheme (notwithstanding the fact that the application is a NOR) and thus override the general rural rules that would otherwise be applicable. The general rural rules apply to all of the area covered by the distribution network.

5.5 In the rest of this section of my evidence, I assess the relevant objectives and policies of the PSDP.

### **Land and Soil**

5.6 As stated above, the distribution network is classed as a 'utility'. The PSDP provides specific rules for utilities, in recognition of the role they play in enabling people and society to provide for their wellbeing. Also of relevance to the distribution network are those provisions relating to the scale of earthworks permitted in the rural zone and their location (e.g., proximity to waahi taonga, flood areas, contaminated soils, etc).

5.7 The relevant objectives and policies are set out in full in Appendix 2 of this evidence. Together they, and their associated policies, have the objective of achieving a number of environmental results:

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- *No increase in contaminated land;*
- *People are not exposed to contaminated land;*
- *No increase in natural hazards by putting structures on unstable land;*
- *Areas where topsoil is removed are recontoured and replanted when the activity ceases; and*
- *Maintenance of the life-supporting capacity of soils.”*

5.8 The conditions volunteered in the both the NOR and the land use applications contain procedures to be followed in construction management plans to ensure contaminants are appropriately managed and adverse effects on health and safety are avoided.

5.9 Similarly, remediation measures are proposed to rehabilitate and restore land, to maintain amenity values, to ensure a stable and durable land surface and to avoid dust nuisance during construction (Objective 1, policies 6 and 7).

5.10 Natural hazards (objective 2) are also the subject of a specific set of objectives and policies which I discuss below in paragraphs 5.54 to 59..

5.11 Objective 3 focuses upon encouraging those activities and management practices that will help sustain the life-supporting capacity of the soils of the District as well as assisting in the prevention of soil loss through erosion. Although there are no specific policies addressing the promotion of life-supporting capacity (other than the provisions for location of residential development - which is a different matter from agricultural production) the issues section of land and soil notes that:

“(v) ... many areas of soils throughout the district are dependent on the availability of water to ensure maintenance of their life-supporting capacities.”

5.12 The Central Plains Enhancement Scheme accords with the maintenance and indeed the enhancement of the life-supporting capacity of the district’s

soils – also a Part II consideration. The delivery of water to the area commandeered by the Scheme will enhance agricultural productivity and improve opportunities for pastoral, cropping and horticultural diversity in the district. This is explained and quantified in the evidence of Mr Donkers, Mr Macfarlane and Mr Donnelly.

5.13 I am aware that many of the Scheme’s opponents point to the adverse effects of “dirty dairying” as adverse effects of the Scheme. I consider that the effects of dairying should be considered separately from the effects of the Scheme because:

- much of the dairying will or does occur in any case, using groundwater;
- dairying will not necessarily remain as a land use in the long term;
- the dairying industry itself is also endeavouring to encourage dairy farmers to adopt practices that are more friendly to groundwater, lowland streams and ecosystem diversity;
- potentially the dairying industry will be subject to increased regulation to control the effects it generates on groundwater quality and waterways; and
- many of the activities of dairy farming are the subject of separate resource consents in any event (specifically discharges of water and contaminants to ground and water).

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However, even if one of the Scheme’s effects is considered to be an increase the number of dairy farms in the Scheme area, the Sustainability Protocol discussed by Ms Mulcock will require Scheme users to promote and require best practice management techniques for soil management, nutrient management, collected animal nutrient, biodiversity and ecosystem management, waterway and riparian agrichemical management and energy management; This is appropriate to avoid the potential adverse effects on the environment of such land use change.

5.14 In broad terms, and even though some 12km<sup>2</sup> will be lost to production by the Waianiwaniwa Reservoir, I consider that the Scheme will contribute positively to the maintenance (and in fact the enhancement) of the life-supporting capacity of soils in the Selwyn District.

### **Indigenous Vegetation and Tree Spread**

5.15 At present, the PSDP does not specifically identify areas for protection because alternative methods were preferred at the time the plan was prepared. Then it was considered sufficient to rely upon:

- the mechanism within the pasture tenure system (in the High Country) and;
- to address significant ecological sites when considering applications for earthworks or forestry (throughout the District).

5.16 The inadequacies of this approach were recognised during the hearing of submissions and a set of interim measures were put in place to protect significant indigenous vegetation while the Council undertook the necessary work to identify significant sites and develop appropriate protection mechanisms. In the meantime, the PSDP's objectives and policies recognise the importance of protecting and enhancing indigenous vegetation, habitats of indigenous fauna and indigenous biodiversity and avoiding, remedying or mitigating adverse effects of activities (Objectives 1, 3, 4; Policies 1, 2, 5 and 6 – See Appendix 2).

5.17 I note that the PSDP specifically recognises the importance of riparian indigenous vegetation (Objective 3, Policy 5).

***“Objective 3***

*Protect, and where practicable enhance indigenous vegetation along riparian margins and wetlands.*

***Policy 5***

*Encourage the retention of existing indigenous vegetation on the margins of lakes, rivers, wetlands and streams and the enhancement of these areas through management practices which allow for the re-*

*establishment of vegetation of the margins of lakes, rivers and streams where it has been depleted.”*

The matter of riparian indigenous vegetation is further picked up in the rules where any destruction of indigenous vegetation located in a naturally occurring wetland is not permitted – it is a non-complying activity.

5.18 The rules were developed as an interim system of management while the Council identifies significant ecological sites and develops appropriate measures to ensure their protection. I note that the Council has undertaken to review the interim rules with a view to notifying a variation or plan change by 28 February, 2009. The rules controlling indigenous vegetation clearance would be put to one side in the area subject to the designation. The interim rules permit the clearance of indigenous vegetation if it meets the following (relevant) conditions:

- Rule IX**
- 1.22.1** - not listed in Appendix 13 (Schedule of Threatened and Uncommon Plants)
  - 1.22.2** - on the Canterbury Plains, not listed in Appendix 14 (Regionally Significant Plants on the Canterbury Plains)
  - 1.22.4** - not located in a wetland
  - 1.22.5** - does not exceed 100m<sup>2</sup>/ha per continuous 3 year period within a distance of 20m of any lake, naturally occurring wetland, river or stream
  - 1.22.6(a)** - does not exceed 5,000m<sup>2</sup>/site per continuous 3 year period (except in improved pastures)
  - 1.22.6(b)** - does not exceed 500m<sup>2</sup> in area where there is a continuous closed canopy exceeding 3m
  - 1.22.6(c)** - does not exceed 500m<sup>2</sup> of continuous block of matagouri exceeding 1.5m in height
  - 1.22.6(d)** - does not exceed 1,000m<sup>2</sup> of tall tussock per continuous 3 year period.

- 5.19 Whether or not the construction of the Scheme under the NOR and the land use consents is consistent with the Plan's objective and policy framework can, to a certain extent, be assessed by considering whether or not the above interim rules would be breached, or if so, to what extent. This then depends whether such indigenous vegetation is in the path of the designation.
- 5.20 This question is addressed in part by Dr Craig Bishop. Dr Bishop explains that although five threatened plant species (that are included in Appendix 13 and 14 of the PSDP) have previously been collected in the vicinity of the proposed intake works, none were recorded from the representative sites he surveyed. He also states that some DOC sites of Natural Significance adjacent to the Waimakariri or Rakaia Rivers have the potential to be affected by the proposed canal. He concludes that localised riparian and wetland losses along the Waimakariri and Rakaia Rivers will be minor and can be mitigated. Furthermore, restoration will enhance habitat. The river and riparian ecosystems in the Waianiwi Valley that will be lost permanently do not have high natural value and as with the major riverbeds, riparian and wetland habitat creation and enhancement would reduce the impact of the effects. In the irrigation area, Dr Bishop expects there will be minor enhancement effects on terrestrial (including wetland) ecosystems, with significant enhancement benefits in the lower Selwyn and Irwell Rivers. Overall, I consider that the Scheme is consistent with the PSDP objective and policy framework for indigenous vegetation.
- 5.21 Once detailed design is underway, proposed conditions to the NOR require the surveying of specific routes/sites for significant indigenous vegetation, and the determination of appropriate methods of protection, if possible. For the distribution network I note that Dr Bishop explains that much of the CPWES irrigation area (through which the distribution network runs) has been modified such that there is little sensitivity to change amongst indigenous vegetation communities. Known sites of higher ecological significance will be avoided where possible. Whilst construction activities have the potential to disturb what indigenous vegetation exists, Dr Bishop

considers such effects to be minor and temporary or avoided or mitigated altogether through the implementation of a works management plan.

- 5.22 Based on Dr Bishop's evidence and the provisions of the land rehabilitation and restoration plan, I consider that the distribution network will be consistent with the objectives and policies relating to indigenous vegetation

## **Water**

- 5.23 As the Selwyn District Council manages land use activities, the plan focuses on the inter-relationship between land use and water quality and contains objectives and policies addressing the issues of:
- pollution of groundwater and waterbodies
  - degradation of natural character along waterbodies; and
  - amenity, cultural and recreational values of waterbodies.
- 5.24 The PSDP recognises that most of the issues relating to ground and surface water are managed by Environment Canterbury. The PSDP's objectives, policies and rules were carefully formulated to focus on land use activities which may affect groundwater, surface water, wetlands or riparian margins, but the objectives and policies exclude Environment Canterbury responsibilities. The PSDP's relevant rules contain controls on matters such as subdivision and the setback from waterbodies of activities such as earthworks and buildings and indigenous vegetation clearance as mentioned above in 5.15 to 5.22.
- 5.25 The District Plan also controls dairy cows (including grazing of dry herds, but not beef herds) by making any new or extended dairy farms a restricted discretionary activity if dairy cows are not excluded from all land within 10m from any waterbody, excluding aquifers (Rule IX 1.10). The application of this rule, even though it only applies to new dairying activity, in combination with the sustainability protocol and farm plan concept required by Central Plains Water Limited (evidence of Ms Mulcock) will go some way in addressing the adverse effects of dairying which is currently the most significant use predicted for the water supplied by the Scheme. In any

case, as I have explained in paragraph 5.13 above, I consider that the adverse effects of dairying have to be considered separately from the adverse effects of the Scheme.

5.26 The key objectives and policies relating to water are set out in Appendix 1 (Objectives 1-6; Policies 1-11). As explained above, they focus on the inter-relationship between land use and matters such as water quality, ecosystem functioning and amenity values of waterbodies in the district. The conditions proposed by the applicant have been carefully formulated to assist in implementing the objectives and policies, largely through careful rehabilitation (Land Rehabilitation and Restoration conditions). In addition the utilitarian nature and small scale of the buildings and structures associated with the distribution network will avoid or minimise any loss of natural character for waterways.

5.27 In respect of avoiding restrictions on access to waterbodies as required by Policy 8, the proposed conditions require the provision of alternative access when any existing public access to a river is restricted by construction works.

***“Policy 8***

*Ensure any earthworks, flood protection works, structures or trees that must be located in riparian margins, or access by stock to riparian margins:*

- *Allow legal public access along the waterway waterbody where appropriate if such access exists, or is desirable for recreation or mahinga kai; and*
- *Take precautions to prevent the introduction of weeds into areas where they are not already present; and*
- *Mitigate any adverse effects on the natural character of the waterway waterbody; and*
- *Avoid adverse effects on trout and salmon habitats.”*

5.28 Policy 2 is an exception to the general subject of policies on water/land use inter-relationship in the PSDP in that it specifically identifies the special

interest of tangata whenua in resource management issues relating to water.

*Policy 2*

*Recognise and provide for the special interest to tangata whenua in resource management issues relating to water.*

The planning maps identify the riverbeds of the Hawkins, Selwyn, Waianiwaniwa (downstream of Homebush Road) as Waahi Taonga management sites. In terms of the PSDP's rules this means earthworks are a restricted discretionary activity although under Rule V:Utilities utility structures are permitted within Waahi Taonga sites and management areas if the utility structure does not involve the disturbance, damage to, removal or destruction of any object, artefact or other symbol of pre-European settlement, occupation or use of that site. As the designation overcomes the rules, in order to fully assess the effects of building the headrace and any other works associated with the Scheme through the designated area, it is necessary to know if any such objects, artefacts or symbol of settlement or occupation of the site lie in the path of the designation footprint. Similarly for the distribution network it is necessary to know if any items of interest would be damaged or destroyed by the proposed works and I note that some distribution canals cross Waahi Taonga management areas..

5.29 This issue is discussed in more detail in paragraphs 5.60 to 5.67 of this evidence under the discussion on objectives and policies for cultural and heritage values.

5.30 Overall I consider that, with appropriate detailed design, the Central Plains Scheme can achieve the PSDP's relevant environmental results for water:

“... ”

*2 Water quality is not degraded by new sources of contaminants in the district.*

*3 Increase in indigenous vegetation planted in riparian margins.*

*4 Flood protection works (and I would include land disturbed for irrigation headworks, canals and river crossing structures) are replanted.*

- 5 *Increased number of esplanade strips or other mechanisms to protect riparian margins.*
- 7 *the natural character of waterbodies is maintained in and some areas restored.”*

### **Outstanding Landscapes and Natural Features**

5.31 As discussed in my introductory discussion on the PSDP (paragraphs 5.1 to 5.4, the Scheme area does not intrude into any areas of outstanding landscapes as shown on the planning maps. Te Waihora/Lake Ellesmere is, however, identified as an outstanding natural feature. Hence Objective 1; Policies 1, 2 and 3, apply peripherally insofar as indirect effects on Te Waihora/Lake Ellesmere are concerned.

### **Transport Network**

5.32 The key issue in respect to transport networks will be ensuring that the roads and railway continue to function, with minimal inconvenience and no safety problems during the construction phase (Objective 1). In addition, any construction of new or temporary roads must be managed to ensure that the effects on the environment are no more than minor (Objective 2).

5.33 Minor inconvenience will occur from time to time during the construction phase where the headrace crosses existing roads. Mr Whaley has discussed the physical effects of construction and the traffic management conditions will ensure that best practice is followed to ensure health and safety and to minimise disruption to traffic.

5.34 I note that the applicant accepts that it is likely to be required that the Midland rail line remain open at all times. As Mr Whaley explains, the construction of the headrace canal and distribution network can be undertaken in a way which will not require the closure of the Midland rail line at any time.

- 5.35 Access to property is a concern for many landholders. As discussed by Mr Lewthwaite and Ms Jamieson, the design/location of the works has gone through a number of iterations hand in hand with consultation. Access to property is a fundamental right and is the subject of conditions – both for the NOR and the distribution network. In general terms, the locations of works subject to the NOR have been chosen to minimise conflict with existing land uses. Further manoeuvring room is available within the footprint of the designation to further fine tune access considerations during the final design of the headrace canal and preparation of the outline plan. This will extend to provide for stock access. When existing property access points are affected, new crossings or bridges will be provided. While some disturbance will be unavoidable during construction, such effects will be short term and minor in nature.
- 5.36 As the distribution network requires land owner agreement prior to construction, property access arrangements will be negotiated with individuals. Generally though, existing property access points will be maintained where possible or replaced with new crossings or bridges (refer condition 7.2).
- 5.37 Through the adoption of the suggested conditions, the construction of the distribution network will only have only short term and minor disturbance effects on the District’s transport infrastructure and hence will not conflict with any of the PSDP’s transport objectives and policies

### **Utilities**

- 5.38 The PSDP recognises that utilities are necessary for people and communities to provide for their wellbeing. While it explains that large-scale utilities have usually been provided for by designations, the plan provides for some utilities which have only minor effects on the environment to be permitted activities, or in some instances restricted discretionary activities.

- 5.39 The works subject to the designation, however, must be assessed in terms of the full set of the PSDP's objectives and policies. Objectives 1 and 2 and Policies 3, 6, 7, 8, 10 and 11 are applicable (Appendix 2) to both the designated works and the distribution network.
- 5.40 It is clear that the PSDP anticipates utilities (Objective 1) but at the same time seeks the management of adverse effects, having regard to the particular requirements and nature of the particular utilities (Objective 2). Obviously the key issues are the effects on the environment, and on people's health, safety and wellbeing. These are the same issues which are at the heart of this hearing. I consider that the utilities which are the subject of the NOR should be the Commissioners' main focus in terms of the utility provisions of the PSDP. This is the subject of all of the technical evidence, particularly that covering landscape, health and safety and riparian areas.
- 5.41 The distribution network predominantly consists of canals and pipes. Other than bridges, pump stations and in race structures, few buildings or other structures will be required in conjunction with the distribution network. Objectives 1 and 2 will also be achieved, with the adverse effects of the distribution network on the environment and on people's health, safety and wellbeing appropriately managed through comprehensive consent conditions and with one-on-one land owner negotiation prior to the confirmation of race routes and construction.
- 5.42 Turning to specific policies, policy 6 seeks to avoid the siting of utility structures or buildings in locations of high amenity value or sensitive to adverse effects, *'unless operational necessity makes this impractical'*. The dam embankment and canal embankments, particularly at Coalgate and where the headrace 'climbs' up the Rakaia terraces are the major structures with the potential to cause adverse visual effects in sensitive areas. The conditions requiring revegetation of these embankments will enable them to be absorbed into the landscape and there are no alternative sites for these key components of the Scheme.

- 5.43 Policy 7 seeks to minimise the reflectivity of utility structures. Bridges and other in-race structures will not be prominently visible features and as such are unlikely to have adverse effects on the features identified by policy 6. Other out-of-race structures (such as pump stations) will be designed and sited to mitigate adverse visual effects and will be subject to conditions of consent stipulating colours and reflectivity. These measures will ensure the utility structures and buildings accord with policies 6 and 7.
- 5.44 Policy 10 relates specifically to the distribution network. It encourages the siting of utilities in road reserves, albeit with minimal adverse effect on traffic safety and flow. Except where consultation with landowners showed a preference for locating canals on their internal boundaries, the route of the distribution network has been located as far as practicable in or immediately alongside road reserves in order to minimise disturbance to private land.
- 5.45 Policy 11 is relevant to the entire Scheme. It seeks to *'Enable the provision of utility networks that serve extensive areas to be located in rural areas commensurate with operational requirements'*. The explanation to this policy recognises that many large scale utilities need to be located according to operational requirements and hence the opportunity for alternative locations may be relatively restricted. Given that the design of the Scheme's utilities and corresponding suite of consent conditions will minimise potential adverse effects on the environment, it is considered that the Scheme will remain consistent with policy 11.
- 5.46 Overall, I conclude that both the proposed designation and distribution network are consistent with the plan's objectives and policies for utilities.

### **Community Facilities and Recreational Areas**

- 5.47 While the Scheme at this stage does not make specific provision for recreational facilities apart from the reservoir which will be a new recreation

resource for the district (at certain times of the year), it is envisaged that picnic and boating access areas will be developed around the reservoir. Designs for these will be developed during the outline plan stage and they are provided for as permitted activities in the PSDP and both the Trust and the Company support the development of such activities.

5.48 Access to the headrace for recreation has been addressed by Mr Lewthwaite. It will have similar dimensions to the Rangitata Diversion Race in mid Canterbury and it is desirable to allow public access at some points, consistent with safety, scheme operations and security. Activities that could be developed include picnicking, walking and kayaking. These are not as yet part of the scheme but recreational development will no doubt occur in the future, subject to the consent of the requiring authority once the scheme is operational. Public access to the intake structures will not be possible for safety reasons.

5.49 Public access to existing recreational resources, namely rivers and riverbeds, will not be removed by any components of the Scheme, although during construction it may be necessary to provide alternative public access points to rivers if construction works impede or restrict existing access points (see proposed conditions).

5.50 Overall, the recreational effects of the Scheme into three categories:

- impact on Rakaia and Waimakariri River and riverbed recreation – discussed by Mr Murray, Dr Glova and Mr Taylor
- the potential of the Waianiwaniwa Reservoir and main headrace to provide for some forms of recreation –including boating on the reservoir and pedestrian/cycle access along the headrace. These opportunities are positive effects of the Scheme
- construction impacts on existing access to rivers. These are short term and can be managed by conditions as proposed.

- 5.51 Overall, I consider that the effects of the land based components of the Scheme recreation are positive and entirely consistent with the relevant District Plan objectives and policies (Objectives 1 and 2; policies 1, 3, 5 and 6).

### **Waste Disposal and Hazardous Substances**

- 5.52 Although the PSDP contains objectives and policies for waste disposal, it is sufficient to say that the proposed conditions in relation to Waste Management and Hazardous Substances will manage any effects such that the Scheme is in accord with the plan's objectives and policies on waste disposal. The PSDP recognises that activities in the rural area require the use of hazardous substances. In this case, it is predominantly the use of diesel in construction activities where there is potential for its storage and use to contaminate land, soil or even waterways, if diesel is spilt. The risks and effects of such contamination are generally similar to those from arable farming except where construction is occurring in or around waterways.
- 5.53 The use of hazardous substances in association with the Scheme will be confined to the construction phase when limited quantities of fuel and oil will be used by construction equipment. This will be stored as necessary in accordance with the proposed conditions for Waste Management and Hazardous Substances in order to limit the risk of spillage or leaks. A Contingency and Response Plan will also be prepared under the proposed conditions and each hazardous substance storage area will be required to be bunded with capacity to contain 120% of the volume of the storage capacity. These provisions are very much in accord with the sort of conditions likely to be imposed on any resource consent required for the storage of hazardous substances in quantities which exceed those permitted by the plan. There is thus no difficulty with the PSDP's objectives and policies in relation to hazardous substances as set out in Appendix 2.

## **Natural Hazards**

5.54 Under the Resource Management Act, both Environment Canterbury and the Selwyn District Council have functions in relation to natural hazards. Although the PSDP does not specifically address the issue of dam safety under the natural hazards section, I believe Objective 1 does encompass this issue as dam collapse would cause a serious natural hazard type effect, and collapse could be caused by a natural hazard event (earthquake).

5.55 I consider that the issue of dam failure is one of the key considerations when assessing the actual and potential effects on the environment of the Scheme. As such, it is subject to Part II considerations as well as being picked up under Objective 1 for hazards:

### ***Objective 1***

1. *Activities do not cause or exacerbate natural hazards.*

5.56 The PSDP recognises that the Malvern Hills area is subject to earthquakes but the applicable policy (Policy 6) is not relevant because it applies only to avoiding (locating) multi-story buildings and critical facilities which are defined as those essential in a civil defence emergency.

### ***Policy 6***

6 *Avoid multi-storey buildings and critical facilities in the Malvern Hills or High Country.*

5.57 For water storage to be part of the Scheme, by definition, some sort of reservoir needs to be built in the Malvern Hills. Mr Davidson has discussed the types of natural hazard and the protective measures incorporated into the dam components in order to avoid dam breach or failure. He concludes that design, maintenance and operation of the dam according to modern design standards are considered to meet internationally accepted

standards. In terms of risk, he has concluded that “the risks of death from dam failure are orders of magnitude less than other risks people live with and often choose in other activities of their lives”.

5.58 In terms of the RMA, the consent authorities must be guided by section 3 which includes in the definition of “effects on the environment ...  
- *any potential effect of low probability which has a high potential impact.*”

5.59 I conclude that the Waianiwaniwa Dam will, by definition, be inconsistent with Objective 1 above and will have effects that are within the RMA’s definition of low probability but high potential impact. The question is whether those risks, given the protective measures proposed to be incorporated into the design to avoid those risks eventuating, are acceptable? If society was totally risk averse, then a project such as this would be automatically precluded and its benefits would therefore not be available to society as a whole. I do not believe this is the intention of the Resource Management Act. Section 5 contains both an enabling function and a management function - including providing for health and safety, while avoiding, remedying and mitigating adverse effects. But while society as a whole will benefit from the construction and operation of the Scheme, the risks of dam failure are borne disproportionately by those people who live below it. Thus questions of equity complicate the risk/benefit assessment that the consent authorities must make under section 5 of the RMA and can only be answered after all the evidence is heard and weighed.

### **Cultural and Heritage Values**

5.60 Objectives 1 and 2 generally seek to protect sites of importance to tangata whenua and sites with recognised heritage values. Supporting policies 1, 2, 4, 6 and 10 encourage the identification and recognition of such sites and these provisions are effected by way of listings in the PSDP and notations on the corresponding planning maps. Policies 2, 3, 7 and 8 generally seek

to protect sites of importance to tangata whenua and where practical avoid adverse effects on other sites of heritage value.

- 5.61 The PSDP identifies the Kowai River “Statutory Acknowledgement Area” and waahi taonga sites (the riverbeds of the Hawkins, Waianiwaniwa [downstream of Homebush Road] and Selwyn [Waikirikiri]). The plan uses a system of identifying titles where known cultural and historic sites are located. It does not show the exact location of these sites. In addition, there appear to be inaccuracies in the district plan information. All but one of the heritage buildings and objects which appear to be possibly affected by the designation, are trees located on Homebush Station, in locations where they will not be in the path of the headrace canal. This leaves the Waimakariri Gorge Bridge, which will not itself be affected by the designation works. It is possible that a heritage feature identified as a “railway long drop” in the PSDP (listed as H143) may be affected by race SH2 of the Sheffield network. However, with the relocation or at least documentation of this item by way of consent condition, no significant adverse effects will arise. The route of the distribution network has been designed to avoid conflict with heritage features identified in the District Plan and whilst a number of sites containing heritage items (e.g. buildings, trees, etc) will be crossed by water races, the features themselves will be avoided.
- 5.62 Dr Habberfield-Short has discussed the archaeological and cultural sites and possible impacts. The possible effects on the historic Ohinekakarite Pa do not appear to be well understood at this stage. A pa at Coalgate could not be found, neither could some archaeological sites such as those at Homebush. Overall, the effects on these previously identified sites appear unknown as explained by Dr Habberfield-Short. While there is some room to fine tune the design route of the headrace canal, and the location of the upper Waimakariri intake works, it is difficult to come to any conclusions at this stage as to whether the sites will be affected by the proposed works, and, if they are, what the impacts of the disturbance/loss will be.

5.63 I suggest that the only approach that can be adopted in the absence of more precise information is to assume that some sites will be destroyed as set out in Dr Habberfield-Short's evidence, but accept his recommendations on how that can be appropriately mitigated. Those recommendations implicitly suggest that the construction of the Scheme provides an ideal opportunity to investigate, record and advance the understanding of the archaeological record. Thus while some sites may not be able to be protected (although most will be) the Scheme could help teach people about the past, by properly recording what was at the site for posterity, an outcome fostered by the PSDP. There may also be sites that are as yet unknown, but which construction of the Scheme could reveal and this is where the accidental discovery protocol, the Scheme footprint survey and the Section 18 Authority from NZ Historic Places Act come in and these are proposed as conditions.

5.64 Without more information, it is difficult to make an overall assessment of whether the Scheme will be consistent with the cultural and heritage objectives and policies. This is because some are worded so as to require protection (Objective 1), although others (Objective 2) are tempered with words such as "when appropriate".

***Objective 1***

*Sites of wahi tapu, waahi taonga, Mahinga Kai and other importance to tangata whenua are protected in partnership with local runanga and landholders*

***Objective 2***

*Sites and buildings with heritage values are recognised and protected, where appropriate, in partnership with landholders.*

5.65 Policies 1, 2, 3, 4, 6 and 7 are also relevant (Appendix 2). None require absolute protection although it is obviously desirable that wahi tapu and waahi taonga sites are protected.

5.66 The conditions proposed require:

1. the preparation of an accidental discovery protocol, for disturbance of koiwi or taonga
2. consultation with local runanga to determine the most appropriate methods for avoiding, remedying or mitigating adverse effects on any PSDP listed Waahi Taonga site, Waahi Taonga Management Area or Mahinga Kai site.

These conditions can be fine tuned to require archaeological survey and the obtaining of NZHPT Section 18 Authorities prior to starting work on the Scheme.

5.67 I conclude that there could be adverse effects on cultural and heritage/archaeological sites that are more than minor. These have to be assessed as part of the overall balancing exercise that has to be made under section 5. However, with the additional surveys and recording proposed by Mr Habberfield-Short, at least the knowledge base will be enhanced, which would be unlikely without a Scheme such as proposed.

### **Amenity Values, Quality of the Environment and Reverse Sensitivity Effects**

5.68 Rural outlook and character are valued by people and this section of the PSDP contains objectives and policies to maintain this quality of the environment and keep it a pleasant place to live and work in. Objective 1 prescribes this general outcome. The applicable policies focus on specific effects such as visual effects (colour), noise and vibration, and these pave the way to the PSDP's rules.

5.69 Mr Glasson's evidence describes how the landscape will change. Generally the character will remain rural, with additional water changing the colour of the landscape to green in normally dry months. While shelter patterns may change, there will be opportunities (and requirement through the sustainability protocol) for ecological enhancement and riparian plantings. Individual components/structures of the Scheme will be obvious while earthworks are exposed but proposed conditions include

requirements for regrassing and revegetating exposed areas of earth, and particularly the dam face and the canals. Once this has occurred, the structures associated with the Scheme will blend into the landscape. It is also proposed to paint structures such as pump houses in colours with low reflectivity. With these measures, I do not believe there will be any adverse effects on rural character. Change in itself is not an adverse effect.

5.70 Conditions have been proposed to ensure adverse effects of noise, dust, lighting and vibration associated with the construction of the Scheme are no more than minor. With these conditions, I consider that the construction and operation of the Scheme is entirely consistent with the applicable Policies 5, 10, 12, 14 and 15 which concern amenity values and the quality of the environment.

## **6. CONCLUSIONS**

6.1 The proposed Central Plains Water Enhancement Scheme will provide significant positive effects, and has the potential for further benefits through provision of recreation facilities which, at this stage, are not the subject of the NOR

### **Positive Effects**

6.2 The positive effects of the additional water provided for irrigation will be the increase in soil life supporting capacity and hence agricultural productivity, together with the economic flow-on effects that will result from irrigation. In addition, the additional water will supplement groundwater and low land streams in the lower plains, and enable wetland and riparian enhancement which can be made a requirement under the Scheme. Other witnesses have detailed these effects. Mr Morrison makes the valid point that a proportion of the increased irrigation may occur anyway if the Central Plains Scheme does not go ahead, either from groundwater or from other run of the river schemes. These will not have the same economies of scale

however, or any storage, so will not be as efficient as the proposed Scheme.

### **Effects on the Environment**

6.3 In a scheme as complex as this, it is inevitable that some components are fundamental to the project while there are alternative methods or routes for others.

6.4 Here the key elements of the Scheme are also those with the potential to generate the greatest adverse effects on the environment. I consider that in considering these applications, the commissioners should focus on the following matters:

1. The effects of taking water from the Rakaia and Waimakariri Rivers.
2. The effects of the dam and reservoir in the Waianiwaniwa Valley.

### **The Rakaia and Waimakariri Water Takes**

6.5 The effects on the in-stream values of the rivers are among the most important considerations of the proposed Scheme and have been discussed in detail by other expert witnesses. I do not address these matters in my evidence.

6.6 Conceptually, the headworks and structures in and beside the Rakaia and Waimakariri Rivers present fewer issues in comparison to the effects of taking the water. I say this for two reasons:

1. Firstly, there is some flexibility in route/location of structures.
2. Secondly, the effects are largely related to short-term construction activities.

6.7 I acknowledge, however, that there are some as yet largely unknown effects of the proposed earthworks in the intake areas (especially for the Upper Waimakariri intake). These effects relate to the possible impact of construction and earthworks on indigenous vegetation and on

archaeological sites. Although conditions are proposed to ameliorate the situation as far as practical, it may be impossible to avoid the destruction of some indigenous vegetation, archaeological sites and taonga. The potential for these adverse effects has to be recognised, but with conditions requiring other indigenous vegetation enhancement, full investigation/documentation as required by the NZHPT of archaeological sites and consultation with tangata whenua in the case of accidental discoveries, I consider that these potential adverse effects can be accepted given the overall benefits of the Scheme.

### **The Waianiwaniwa Dam and Reservoir**

- 6.8 The proposed reservoir will provide storage that is fundamental to the water harvesting concept of the Scheme as discussed by Mr Tipler. It thus enables many of the benefits of the Scheme that could not be available with individual groundwater sourced irrigation, or with smaller, run of the river community schemes. It will also provide for some recreational opportunities, although those that are water based will be seasonal. It does, however, flood some 12 km<sup>2</sup> of farm land and inundate some wetland and riparian ecosystems. Farmers who lose land to the reservoir will be compensated, using the provisions of the Public Works Act as necessary.
- 6.9 New roads will be built to provide alternative access for roads which are cut due to inundation. Protection and enhancement of mudfish habitat (outside of the Waimiwaniwa), and lakeside amenity plantings (as part of the proposed Landscape and Rehabilitation Management Plan) are proposed as conditions of consent. It is anticipated that lakeside areas will be developed for recreation in the future but these need to be designed and may well need future resource consents, so cannot be considered at this stage. These enhancement measures, in conjunction with the payments to affected landowners will, in my opinion, adequately compensate for the adverse effects of the dam, given the benefits of the stored water.

6.10 This leaves the effects of the dam structure itself as the major considerations. Here I consider that the risk and consequences of dam breach are the most important, as the visual impacts of the dam itself will be mitigated to a large degree by requiring it to be revegetated as Mr Glasson has recommended. As I explained in paragraphs 4.19-23 of this evidence, the effects of dam breach have a low probability of occurrence, but with high potential impact. Furthermore, the risks are not necessarily borne by those who benefit the most from the Scheme. Similar situations exist in respect of other communities living downstream of major dams such as on the Waitaki and Waikato Rivers. Based on the evidence of Mr Davidson, Mr McMorran and Mr Gillon, I conclude that provided the dam is built and maintained to internationally accepted standards, the risks are tolerable, especially in comparison to other risks society lives with on a daily basis and considering the overall benefits of the Scheme as a whole.

### **The Canal Headrace**

6.11 The canal headrace is the remaining component of the NOR. I consider that its potential effects are not as significant and hence not as fundamental to the overall decision making exercise as the taking of water from the rivers and the creation of the Waianiwanawa Dam and reservoir. I say this because:

1. Many of the effects are construction related, will be short term and can be appropriately avoided, remedied or mitigated by detailed design and conditions and good management.
2. The long term effects are largely visual and with appropriate rehabilitation including re-vegetation as required by the proposed conditions, the canal and associated structures will blend in with the landscape in a similar manner to the Rangitata Diversion Race, which is now an accepted part of the Mid Canterbury landscape.

### **The Distribution network**

6.12 It is emphasised that in seeking resource consent for the distribution network (rather than a designation), land owner agreement will be required

prior to the commencement of any works. This will require further consultation and negotiation with individual landowners about any particular requirements they may have in regards to the construction and operation of the network (e.g., access arrangements, stock control, race positioning/relocation, etc) and reimbursement for the loss of any land. Accordingly, it is anticipated that almost all site-specific concerns of landowners will be resolved before the ability to undertake the works on the land is secured by the applicant. Given the consequential refinements to the route of the network which will be required, it is inevitable that further consents and or changes of consent conditions will be necessary. Notwithstanding, the network as currently proposed represents a feasible layout for which consent can be assessed and obtained, for subsequent refinement and ultimately construction.

### **Overall Conclusions**

- 6.13 My evidence has concentrated on the effects of the Scheme in terms of the RPS and, in particular, of the PSDP. Overall, I conclude that the Scheme will enable people and communities to provide for their wellbeing through enhanced availability of water for agriculture; enhancement of riparian areas, wetlands and low land streams. The possibility of additional recreational facilities is a further area of possible benefits but these cannot be counted on at this stage because none have actually been proposed. At the same time, I believe that with appropriate final design, management plans and conditions as proposed, the adverse effects on the environment are able to be avoided, remedied or mitigated. There will be significant social and economic benefits to people and communities in the Canterbury region, with flow on effects nationally. The Scheme is not contrary to the objectives and policies of the RPS or the PSDP. It promotes the sustainable management of natural and physical resources and thus achieves the purpose of the Resource Management Act.

**Susan Robson**