BEFORE THE CANTERBURY REGIONAL COUNCIL


AND

IN THE MATTER OF: a submission on the Proposed Canterbury Land and Water Regional Plan - Plan Change 3

LEGAL SUBMISSIONS ON BEHALF OF
DIRECTOR-GENERAL OF CONSERVATION
Dated 16 November 2015

Director-General of Conservation
Private Bag 4715
Christchurch 8140
Tel: (03) 371 3700
C/o: Herb Hamilton

Counsel: Susan Newell
Legal Submissions for the Director-General of Conservation

Introduction

1. The Director-General of Conservation (the Director-General) submitted (25 May 2015) and further submitted (17 July) on proposed Variation 3 (now Plan Change 3) to the Proposed Canterbury Land & Water Regional Plan – Section 15 Waitaki and South Coastal Canterbury. The Director-General’s submission is generally supportive of the Plan change.

2. In these submissions I intend to focus on two matters on which the Director-General has submitted:
   a) the protection of threatened indigenous species - namely the Canterbury mudfish; and
   b) the regime that will apply to any application for consent to augment Wainono Lagoon with additional water, and consequential application of caps on nitrogen discharges.

3. The decisions sought by the Director-General are to address section 6(c) of the Resource Management Act 1991 (the RMA) which, as a matter of national importance, requires the Canterbury Regional Council (the Council) as a decision-maker under the RMA to recognise and provide for:

   "...the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna".

Outline of Legal Submissions

4. These submissions will cover the following matters:
   a) The functions of the Director-General and the Department of Conservation (the Department)
b) The Council’s functions under section 30(1) of the Resource Management Act 1991

c) The protection of mudfish habitat

d) Wainono Lagoon

Functions of the Director-General and the Department

5. The Director-General is the administrative head of the Department, and as such is the person who is able to make submissions under the Resource Management Act 1991 (RMA).

6. The functions of the Department are set out in section 6 of the Conservation Act 1987, and relevantly include:

(a) to manage for conservation purposes, all land, and all other natural and historic resources, for the time being held under this Act, and all other land and natural and historic resources whose owner agrees with the Minister that they should be managed by the Department:

(ab) to preserve so far as is practicable all indigenous freshwater fisheries, and protect recreational freshwater fisheries and freshwater fish habitats:

(b) to advocate the conservation of natural and historic resources generally:

...  

(g) every other function conferred on it by any other enactment.

7. In relation to the above functions, the Director-General’s powers include all those reasonably necessary or expedient to enable the Department to perform its functions, including to advocate the conservation of aquatic life and freshwater fisheries generally: section 53(3)(d) Conservation Act 1987, and to protect habitats: section 53(3)(f).

8. The Conservation Act has, as might be expected, a conservationist focus and this is reflected in its definitions of “freshwater”, “freshwater fish” and
"fishery" which differ from the RMA definitions of "fresh water", "fish" and "fisheries resource" (see Appendix 1).

9. I submit it is important to be aware of these differences in understanding the submissions and evidence presented on behalf of the Director-General.

The Council's function under section 30(1)RMA

10. The Council has a number of functions under section 30(1) in giving effect to the RMA that are relevant in the context of this plan change. They include:
   - the section 30(1)(c)(ii) function to control the use of land for the purpose of maintenance and enhancement of the quality of water in water bodies and coastal water; and
   - the section 30(1)(c)(iii)(a) function to control the use of land for the purpose of the maintenance and enhancement of ecosystems in water bodies and coastal water.

11. The Council's paragraph 30(1)(ga) function is "the establishment, implementation, and review of objectives, policies, and methods for maintaining indigenous biological diversity".

12. In my submission, the section 30(1)(ga) function mandates the inclusion in the plan of provisions for maintenance of mudfish habitat.

Canterbury mudfish

13. The Director-General has proposed the insertion of new provisions to more effectively protect Canterbury mudfish habitat. In his evidence Mr Hamilton has included proposed text for a rule to achieve that protection, and a list of mudfish habitat locations which, I submit, can be regarded as significant habitat of indigenous fauna to which section 6(c) of the RMA applies.
14. The evaluation criteria for identifying significant habitat for the purposes of section 6(c) were discussed in Minister of Conservation v Western Bay of Plenty DC EnvC A071/01. The criteria include rarity, size and shape (affecting long term viability of a species), inherent ecological viability, and vulnerability of the site. When those criteria are applied, it seems evident that mudfish habitat in the South Canterbury coastal area as described by Dr Dunn can be considered significant.

15. Dr Dunn has also described how mudfish habitat is lost. His examples are illustrative of the need for plan provisions and a schedule of sites as sought by the Director-General. They demonstrate that the approach contended for in the officer’s report heightens the risk that protection of mudfish habitat may be completely overlooked when processing applications for consent.

16. The Councils’ approach appears to rely on a general requirement to consider effects on ecosystems, and seems to assume that staff processing consent applications and consent holders themselves could not benefit from more specific plan provisions identifying significant habitats of Canterbury mudfish.

17. That proposition is similar to one considered by the Environment Court recently, in Opoutere Ratepayers And Residents’ Association v Waikato Regional Council [2015] NZEnvC 105, in which the Council accepted an area was of ecological significance requiring protection, but contended that specific identification was not required.

18. The Court also accepted that there were ecological values present (which, in that case, were required under the New Zealand Coastal Policy Statement to be protected). At issue was how such protection was to be achieved, and whether protection required identification by mapping in the plan or otherwise. The Court stated (at 98) that:
"...whilst there are a number of ways in which such areas can be identified, this does not mean a choice can be made not to identify them. The reason for this, in our view, is obvious given the purpose of the Act, and the requirement in s6(c) that all persons exercising functions and power under the Act in relation to managing the use, development and protection of natural physical resources are required to recognise and provide for the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna as a matter of national importance”.

19. The Court went on to conclude that specific identification of ecologically significant sites in the plan “would also mean that decision-making on resource consent applications and designations (and potential applicants and submitters) would be clear on the ecological values of the area and the policy to be applied to protect those ecological values”.

20. That Court’s observations regarding the benefits of clarity in planning instruments for decision makers, applicants and submitters are apposite, and I suggest that recent loss of mudfish habitat described at paragraph 28 of Dr Dunn’s evidence may well have been avoided had the plan contained a map or schedule of sites as proposed by the Director-General.

21. There is no impediment to inclusion of the proposed provisions in relation to the use of private land; such provisions would be consistent with Council’s mandatory function under s30(1)(ga) to make objectives, policies and methods for the maintenance of indigenous biological diversity (see Property Rights in New Zealand Incorporated v Manawatu-Wanganui Regional Council [2012] NZHC 1272).
Augmentation of Wainono Lagoon

22. The Department’s interest in Wainono Lagoon and the public conservation land in its vicinity are explained in Mr Winterburn’s evidence. The bird life supported by the lagoon, including threatened and at risk species, is described by Mr Grant.

23. Plan change 3 includes provisions for augmentation of Wainono Lagoon with water from the Hunter Downs Irrigation scheme in order to improve water quality in the lagoon. The Director-General supports the proposition that if water quality in the lagoon can be improved by augmentation, it should be enabled, provided the consenting regime for augmentation is appropriately structured. Changes in land use following augmentation (such as access to flexibility caps) should be contingent on improved water quality not simply augmentation alone. Given the current degraded water quality in the lagoon, the somewhat experimental nature of augmentation, and the limited options to prevent further degradation if augmentation is not successful, I submit that a cautious approach is warranted.

24. Relevantly to the risk of further degradation of water quality, it is worth noting the observations of the decision-makers when consent for the Hunter Downs Irrigation scheme was granted in 2010. (When that decision was made, it was assessed against the objectives of the then proposed Natural Resources Regional Plan).

25. The decision makers recorded their concern that water quality of Wainono Lagoon was characterised by high to very high nutrient levels, and that all the submitters and witnesses they heard from agreed “water quality would probably worsen under HDI even with proposed mitigation” (Decision on resource consent application CRC 071029, 27 April 2010, paragraph 830).
26. When commenting on evidence about the prospect that “there will inevitably be increases in nutrient levels” the decision-makers stated that that reality of the situation highlighted “...significant reliance on Scheme and Farm Management plans being wholly adopted, implemented and adhered to throughout the HDI scheme area in order to reduce the degree of potential adverse effects on water quality and surface water ecology” (paragraphs 836-837). They concluded that “there is a possibility that periphyton growth in rivers and phytoplankton biomass in Wainono Lagoon will occur under HDI, even with proposed mitigation” (paragraph 850).

27. Inevitable increases in nutrient levels and adverse effects on water quality such as those contemplated in that 2010 decision are inconsistent with the National Policy Statement for Freshwater Management 2014, Objective A2. Augmentation is proposed as a solution. However, the evidence of Dr Schellenberg and Dr Gerbeaux is that there is some uncertainty about how the lake will respond to augmentation. In my submission it is, therefore, important to take a precautionary approach by retaining a link between improvements in water quality and land uses. This is achieved by linking the water quality outcomes in tables 15(a) and 15(b) of the plan, anticipated as a result of augmentation, and nutrient discharges. In this respect, I wish to draw the panel’s attention to the importance of the asterisked note at the foot of table 15(m).

28. Dr Gerbeaux has discussed the relative importance of water quality indicators. Significant water quality indicators in table 15(b) are those in the column headed ‘Visual Quality Indicator’ – the presence of macrophytes and associated water clarity, along with appropriate E.coli concentrations for mahinga kai harvesting.
29. The Director-General’s submission seeks retention of Tables 15(m) and (n), as well as 15(b) (amended to include the appropriate E.coli levels). That submission is based on an understanding that both augmentation and achievement of all the water quality indicators in the tables are a necessary precedent to be achieved before the flexibility caps in column C of table (m) can be accessed.

30. I understand the panel may consider whether re-drafting can improve clarity and ease of use of the plan. If that is the case, the link between tables 15(a),(b) and (m) which is achieved through the asterisked footnote to table 15(m) could, in my submission, be made clearer.

Conclusion

31. The Director-General now seeks amendments to plan change 3 as further set out in the evidence of Mr Hamilton. In my submission the amendments sought will address the Council’s section 6(c) obligation as well as meeting its section 30(1)(ga) function to establish and implement objectives, policies and methods (including rules) to maintain indigenous biological diversity in the South Coastal Canterbury area.

Susan Newell
Solicitor
Appendix

Conservation Act 1987, section 2 definitions:

fishery means 1 or more stocks or parts of stocks or 1 or more species of freshwater fish or aquatic life that can be treated as a unit for the purposes of conservation or management

freshwater means—
(a) all waters of rivers, streams, lakes, ponds, lagoons, wetlands, impoundments, canals, channels, watercourses, or other bodies of water whether naturally occurring or artificially made:
(b) all waters of estuaries or coastal lagoons:
(c) all other fresh or estuarine waters where freshwater fish indigenous to or introduced into New Zealand are found:
(d) all waters in the mouth of every river or stream, and the mouth of every river and stream shall be deemed to include every outlet thereof and the seashore between those outlets and the waters of the sea or lying within a distance of 500 metres from any place where at low tide the waters of a river or stream meet the waters of the sea freshwater fish includes all species of finfish of the Classes Agnatha and Osteichthyes, and all shellfish of the Classes Mollusca and Crustacea, that must, at any time in the life history of the species, inhabit fresh water; and includes any part thereof and such finfish and shellfish that seasonally migrate into or out of freshwater

Resource Management Act 1991, section 2 definitions:

fish has the same meaning as in section 2(1) of the Fisheries Act 1996
fisheries resources has the same meaning as in section 2(1) of the Fisheries Act 1996
fresh water means all water except coastal water and geothermal water

coastal water means seawater within the outer limits of the territorial sea and includes—
(a) seawater with a substantial fresh water component; and
(b) seawater in estuaries, fiords, inlets, harbours, or embayments
[NB: “seawater” is not defined in the RMA]

Fisheries Act 1996, section 2(1) definitions:

fish includes all species of finfish and shellfish, at any stage of their life history, whether living or dead

fisheries resources means any 1 or more stocks or species of fish, aquatic life, or seaweed
IN THE MATTER of the Resource Management Act 1991

AND

IN THE MATTER of two references under clause 14 of the First Schedule to the Act

BETWEEN MINISTER OF CONSERVATION (RMA 1311/95)

AND ROYAL FOREST & BIRD PROTECTION SOCIETY OF NEW ZEALAND INCORPORATED (RMA 1315/95)

Appellants/Referrers

AND WESTERN BAY OF PLENTY DISTRICT COUNCIL

Respondent

BEFORE THE ENVIRONMENT COURT

Environment Judge R J Bollard (presiding)
Environment Commissioners A H Hackett and I G McIntyre

HEARING at TAURANGA on 12, 13, 14 and 15 December 2000; 26, 27, 28, 29 March and 2 April 2001 (final written submissions received 5 July 2001)

COUNSEL/APPEARANCES

A F D Cameron and M A Baker for Minister of Conservation
K R M Littlejohn and L Conning for Royal Forest & Bird Protection Society Inc.
P H Cooney for respondent
S Millar for Federated Farmers of New Zealand Inc (leave to withdraw)
A P Coster for Federated Farmers (Bay of Plenty Branch)
B S Roberts on behalf of himself and his wife, R A Coster, L M Scott, and G L Hackersey, submitters in opposition
INTERIM DECISION

Introduction and Basic Issues

[1] The proposed district plan for the Western Bay of Plenty district (the plan) was notified by the Western Bay of Plenty District Council (the Council) in July 1994. The plan as notified contained a schedule of 240 ecological sites containing indigenous vegetation and/or indigenous fauna that were identified on the planning maps and protected by rules. Many affected landowners evinced opposition. Whilst there was reasonable acceptance that the most highly valued sites should be protected via the plan, a repeated plea emerged that sites of lesser value should be left simply to the devices of relevant landowners without the need for a formal system of planning control.

[2] Consequent upon the Council’s decisions on submissions, the plan’s schedule was amended to provide for 107 sites ranked as “exceptional/outstanding” and “very high/high”. However, those areas having a “high value (botanical)” or “moderate high (wildlife)” or less were excluded. Both the Minister of Conservation (the Minister) and Royal Forest & Bird Protection Society of New Zealand Incorporated (the Society) lodged references with this Court challenging the accuracy of the proposed schedule (the schedule) and other provisions in the Natural Environment section of the plan. The references came on for hearing in December 1996, but were adjourned part-heard to afford the Council the opportunity to carry out further research in consultation with the Department of Conservation (DoC), the farming community and other bodies or groups, with a view to revising the schedule by way of a variation to the plan – any appeals against the variation to be brought on for hearing in conjunction with the resumption of hearing of the present references.

[3] Subsequent to the December 1996 hearing, the Council and DoC identified and agreed on 51 sites within the Western Bay of Plenty district as having a “high” or “moderate high” level of significance in botanical or wildlife terms. DoC also identified a further 14 sites that it considered fell into one or other of those categories, but the Council disputed that assessment. In the upshot the Council decided that there was no need to revise the schedule. It was considered that sites not specifically listed would be preserved in any event. That view was derived having regard to the lack of any perceived “threat” by landowners, and the rapport believed to exist between members of the farming community within the district and the Council.
[4] The Minister and the Society were concerned at the Council’s stance. In the absence of a variation to the schedule incorporating the extra 51 identified sites (plus 14 more in contention), it was felt that the only sensible course was to urge this Court to endorse a general form of plan control designed to protect those sites in particular. It was common ground that the additional 51 sites at least are of significance from a district perspective - albeit not aspiring to levels of greater (e.g. regional) significance, by contrast with most of, if not all, the scheduled sites. In short, it was acknowledged that the schedule incorporates areas of indigenous vegetation or wildlife habitat of prime levels of significance within the district, but omits to include other sites that are of significance from a district perspective albeit at a lesser level.

[5] The omission arises because the Council considers that the schedule is sufficiently comprehensive for district planning purposes – not overlooking the need to recognise and provide for s.6(c) of the Act (as to the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna). A major question that soon emerged during the hearing was, how noteworthy must an area or habitat be for categorisation as significant within the meaning of paragraph (c)? As will be seen, the outcome of these proceedings really turns on the practical application and effect of the word “significant” in the context of paragraph (c) and the Act’s purpose, having regard to the evidence placed before the Court concerning the Western Bays district.

[6] As the hearing progressed, it became increasingly evident, going by different drafts submitted by counsel for the Minister regarding the suggested form of land clearance control to be included in the plan, that such an approach would not be straightforward for the Council to administer satisfactorily in practice. From the point of view of the Minister, supported by the Society, it was said that, were it not for the alleged inadequacy of the schedule, the incorporation of a regulatory “backstop” would not have needed to be pursued. Their basic concern was that the plan as it stands fails properly to bear out the Council’s duty to heed s.6(c) of the Act as a matter of national importance.

[7] Enquiry was made of counsel for the Council whether, in the event of our determining in favour of the Minister and the Society, the Council would prefer a controlling provision in the plan, or further opportunity to formally amend the schedule by way of notified variation. After taking instructions, Mr Cooney advised that the Council’s clear preference would be for the latter course.
[8] Another issue raised by the Society was whether the grazing of livestock within the significant sites or areas currently contained in the schedule should be a prohibited activity. Such a restriction was opposed by the Council on practical grounds bearing on perceived difficulties of enforceability, coupled with a lack of evidence to demonstrate that scheduled sites are suffering appreciable degradation through indiscriminate stock grazing practices. Furthermore, the Society proposed that controls be placed on the logging of native timber, irrespective of whether that activity would be permissible under the Forest Amendment Act 1993.

[9] The Society also raised and pursued the following issues independently of the Minister. First, it was claimed that the farming of certain species of deer, and the farming of goats, should be limited discretionary activities within two kilometres of specified natural areas of obvious significance such as the Kaimai/Mamaku State Forest Park. Secondly, it was proposed that those activities be otherwise permitted in the Rural G and H zones (being the main rural zones under the plan) provided certain fencing standards are met.

**Nature of Cases of the Council and Submitters in Support**

[10] At the outset, it was pointed out for the Council that a number of changes have occurred in the district since notification of the plan in 1994.

- Fencing subsidies through local authority initiative were introduced to assist landowners in protecting ecological areas.

- Transferable development rights (TDRs) have been introduced for Protection Lots, allowing owners of ecological features to on-sell their subdivision rights.

- The Protection Lot rule (including TDRs) has been widened to include regenerating forest, riparian vegetation and wetlands. Furthermore, the relevant threshold criteria have been reduced, thus rendering the rule more attractive to landowners.

- Ecological development impact fees are provided for in order to assist the Council in taking a pro-active approach to environmental protection.
• Funding by the Council of a "Stream Sense Programme", designed not only to provide monitoring data on the health of the district's environment, but also as a method of sharing information and fostering community education.

• Development of an education programme, including participation in farm field days and joint production of pamphlets with DoC and the Bay of Plenty Regional Council.

[11] Witnesses called for the Council, or who gave evidence as s.271A parties supportive of the Council, were of the view that, as of today, a widespread community awareness exists of the importance of the district's indigenous vegetation and fauna habitats and the need for conservation and protection. Those witnesses included in particular, Mr P S Martelli, the managing officer of the Council responsible for preparation of the plan; Mr D C Slaven, a principal of the consulting firm Boffa Miskell Limited, whose expertise lies in the field of ecological survey assessment and evaluation; and various persons with lengthy farming experience and useful personal insight.

[12] Evidence for the Council was to the effect that to justify the introduction of an indigenous vegetation clearance control rule, we would need to be satisfied that the threat to significant vegetation (not listed in the schedule) is real. As Mr Cooney contended in his concluding submissions, the question for the Court is "whether the level of risk is unacceptable to the extent regulatory controls are necessary to address the risk".

[13] The perceptions of Mr Martelli and Mr Slaven of a low risk element, supported by similar viewpoints of Mr B S Roberts and other submitters as experienced farmers, were emphasised. Their evidence, viewed collectively, was claimed to warrant a conclusion that "the threat to vegetation clearance in the district does not exist to any degree as to cause concern". The appropriate method of effective protection was said to lie in the Council keeping abreast of modern needs and expectations of the community in relation to natural resources by not introducing unnecessary planning controls merely for the sake of control. Rather, due deference should be afforded to the generally responsible attitude of rural landowners towards protection of indigenous vegetation - including a noticeable and continuing trend for landowners to seek voluntary protection (via covenants and the like) of remnant bush areas. Coupled with that should be the provision of incentives of the kind that the
Council has promoted, along with a process of good communication and education as between the Council and the inhabitants of the district whom it represents.

[14] Reasons why an unacceptable level of risk to unscheduled sites was thought unlikely were said to include the following:

- The general attitude of the rural community of the district is to preserve significant areas of indigenous vegetation;

- According to available data, about 86% of the district’s indigenous vegetation is situated on land of a slope 15° or more. That factor was acknowledged by Dr B D Clarkson, Associate-Professor and Director of the Centre for Biodiversity and Ecology Research at the University of Waikato, who was called as a consultant expert for the Minister. Much of the land is within steep gullies and corridors, thus rendering it relatively unattractive for active farming purposes;

- Protection lot/TDR subdivision rules provide a powerful economic incentive for rural landowners to preserve areas of indigenous vegetation or otherwise of ecological significance. According to Mr Martelli, an additional title created through the protection lot/TDR subdivision rules generally attracts a value of $100,000 or more. The popularity of this option for landowners created by the plan is evidenced by some 900ha having been certified for protection to date;

- The proposed Regional Land Management Plan fulfils a significant role in effectively assisting the protection of significant indigenous vegetation. Under that plan, indigenous vegetation disturbance on slopes greater than 15° is a discretionary (restricted) activity. Given the 86% figure mentioned above, the rule is applicable to the preponderance of indigenous vegetation in the district. Even so, it was contended for the Minister and the Society that the essential purpose of the rule is to control adverse effects of disturbance to land through earthworks and consequent impacts on water quality, rather than protection of vegetation as such.

- The Council has resort to various non-regulatory means or mechanisms geared to reducing the level of risk to indigenous vegetation and ecologically important areas, such as fencing subsidies and educative processes.

- Requirements under other legislation such as the Forest Amendment Act 1993 should be borne in mind and taken into account.
[15] As to the deer and goats issue raised by the Society, the Council's case was based primarily upon the following contentions:

- No significant problem currently exists in reference to deer and goats escaping from farms within the district and entering major forest park areas;

- The Minister has not chosen to join force with the Society in the stance that a 2km restriction zone (earlier explained at paragraph [8]) is warranted;

- Adequate protection would be afforded for RMA purposes by including a fencing standard in the plan for each activity in the form suggested by the Council - in preference to an alternative (higher) standard in each case propounded for the Society;

- Instances where deer have escaped into the Kaimai/Mamaku Forest Park have been isolated, and, according to a witness with appropriate knowledge and background called for the Council, have likely resulted in recreational hunters culling any such escapees within the park;

- As to goats, the problem (such as it exists) is centred mainly in the Opotiki/East Coast area. In the Western Bays' district, comparatively little damage is occasioned by goats escaping - as evidenced by the paucity of reports to the Council and given farmers' concerns (as explained by a goat breeder of considerable experience called for the Council) to prevent feral goats from entering goat farms and cross-breeding. In other words, goat farmers of the district have a high incentive to maintain security, albeit for the main purpose of preventing feral goat entry, while at the same time ensuring that non-feral animals remain enclosed.

**Nature of Cases of the Minister and the Society**

[16] The critical difference between the perspective of the Minister and the Society and that of the Council lies in the contention that, useful and constructive though "voluntary mechanisms" may be, those mechanisms by themselves are insufficient. According to the appellants, inadequate assurance is afforded via such mechanisms to bear out the Act's intent of protection in terms of s.6(c) as a matter of national importance. In essence, the concern of the Minister and the Society relates to the Council having declined to revise the schedule. Because sites are omitted of
admitted significance at district level, (albeit of lesser significance by contrast with
other scheduled sites of superb quality), the “more moderate” sites are still
considered to warrant protection within the schedule. While acknowledging that
many landowners can be expected to entertain and adopt a responsible approach to
conserving significant indigenous vegetation and indigenous fauna habitats, the risk
of occasional damage or destruction is seen as ever-present. It is contended that
incidents can always arise through inappropriate management practices, financial
influences, lack of adequate awareness of environmental values, or a combination of
these and other individual-inducing factors.

[17] For the Council it was pointed out that inclusion within the schedule or
introduction of a form of back-up control would not be steps that, of themselves,
could guarantee protection. The response for the Minister was that to have an
inadequate schedule plus no form of back-up control would mean failing to heed the
importance attached to the protection concept that the Act imports. The Council, so
it was postulated, is under a responsibility, in fulfilling its role as planning authority,
actively to recognise and provide for the protection element by incorporating
controlling provisions within the plan.

[18] Importantly, in determining whether an area of indigenous vegetation or a
habitat of indigenous fauna is significant for the purpose of paragraph (c), the area or
habitat is not required of itself, or in combination with other areas or habitats, to be
nationally important. Neither does its importance have to be regional in character or
otherwise exceed the bounds of the planning district. Rather, it is a question of
identifying and assessing (with the aid of qualified advice and assistance) those areas
or habitats that are significant within the district as to require protection.

[19] “Significant” in its context necessarily imports the notion of informed
judgement as to those natural resources of the district that need to be protected. In
the case of Western Bays, a factor in coming to that judgment is the extent to which
the biodiversity resource of the district has already been diminished. As Dr Clarkson
commented:

Indeed, in parts of the coastal zones the loss is on a par with the districts having
greatest loss anywhere in New Zealand including the Canterbury Plains, Waiapoa
River Plains (Gisborne), Wairarapa District and the Taranaki ringplain.

[20] Dr Clarkson went on to specify a list of evaluation criteria bearing on the
issue of significance, which it will be helpful to record in summary. They comprise:
representativeness (concerning the extent of range of genetic and ecological
diversity); diversity and pattern (in relation to ecosystems, species and landforms); rarity factors and/or special features; naturalness/intactness; size and shape (affecting the long-term viability of species, communities and ecosystems, and amount of diversity); inherent ecological viability/long-term sustainability; relationship between natural areas and other areas of more modified character (inasmuch as well-buffered areas linked to other natural or semi-natural areas tend to have higher value than unbuffered isolated ones); vulnerability to “threat processes” liable to disturb existing equilibrium; and finally, management input required to maintain or enhance an area’s significance (including nature and scale of input or degree of intervention, and degree of restoration potential).

[21] We refrain from characterising the above criteria as definitive or exhaustive for general purposes. But for present purposes they represent a helpful means of guidance in assessing an item’s significance. They also lend a better understanding of how Dr Clarkson went about assessing various presently unscheduled sites pointed to in his evidence, and why he was of the firm opinion that the schedule is notably deficient.

[22] Counsel for the Minister tendered various drafts and suggestions for a form of land clearance protection rule to be inserted in the plan in the absence of the schedule’s revision. Difficulties emerged as the hearing progressed in reference to those drafts and incidental suggestions. We see no need to traverse the relevant issues and related difficulties in formulating a suitable form of general control, because, for reasons later appearing, we are prepared to accept that conversion of the schedule to a state of relative comprehensiveness would suffice to obviate the need for such a control.

Discussion and Evaluation

[23] Lengthy evidence was adduced for both the Minister and the Society. Additional to hearing from Dr Clarkson in support of the Minister’s appeal, evidence was given by Ms M S Long, a qualified planner employed at the Bay of Plenty Conservancy of DoC who has been involved in various processes concerning the inclusion of provisions in district plans designed to progress significant natural resource protection issues. For the Society, evidence was adduced from Mr B S L Graeme, a field officer for the Society and environmental consultant; also from Mr P E Jaques, who addressed the deer and goats and stock grazing issues - as did Mr G
O'Reilly-Nugent, a qualified zoologist with research experience in environmental impacts of deer and goats.

[24] Ms Long pointed to Section 9 of the plan – Natural Environment as being the main section that addresses indigenous vegetation modification. In an explanatory statement to that section it is noted that the primary objective is to promote the sustainable management of the remaining natural environmental resources of the district. It is also noted that the policies and methods of the plan focus on the protection of identified sites included on the planning maps and scheduled in Appendix I to the plan.

[25] Salient issues from Section 9 were pointed to, including statements that—

Significant remaining indigenous native forests, wetlands, riparian and coastal habitats are under threat from human-induced activities.

The extent of indigenous habitats is diminishing and there is inadequate protection of the remaining areas. Low land habitats tend to be under the greatest threat.

Inappropriate land management practices (rural and urban) often occur on or adjacent to important habitats. Examples include pollution from stormwater runoff, damage caused by stock grazing and rubbish disposal.

[26] Objective 9.2.1 of the plan refers to protection of all significant native plant and animal habitats and ecosystems within the Western Bay of Plenty District. The objective is followed by various supportive policies including—

Protection of ecological sites that have been scientifically identified as worthy of protection. Protection of ecological corridors between significant native habitats and ecosystems.

Adopt an approach which is precautionary but responsive to increased knowledge where the management of the environment is hindered by lack of understanding about processes and the effects of activities.

Activities should not adversely affect any significant native plant and animal habitats and ecosystems.

[27] At heading 9.3 Rules, provision is made for the types of activities that are either permitted, controlled, discretionary or prohibited as regards sites scheduled in Appendix I. The Court was not invited in the context of the present hearing to alter those provisions in the event of the schedule being expanded – save to consider the prohibition of stock grazing within scheduled areas and the deletion of native forest logging under the Forest Amendment Act 1993 as a permitted activity. In effect, the appellants were agreed for practical purposes that revision of the schedule would be
a positive and worthwhile step in better protecting significant areas or habitats within the meaning of s.6(c). The core issue therefore is whether the schedule as it stands needs to be expanded to the state of comprehensiveness contended for by the appellants by embracing a sizeable range of additional sites of claimed significance, assuming that no back-up rule is introduced.

[28] As earlier noted, Dr Clarkson was adamant that the schedule, as it presently stands, is notably deficient in failing to list many sites of significance within the district. As he put it, the schedule is incomplete because it uses an “arbitrarily high threshold” for site inclusion. In his view, factors of spatial configuration and depletion of indigenous vegetation and wildlife habitat in the coastal, semi-coastal and lower lowland zones have not been afforded adequate weight. He estimated that at least sixty significant sites, exceeding 8000ha overall and representing approximately 4% of the district’s land area, have been omitted.

[29] Dr Clarkson went on to explain:

“The key point I reiterate here is that the existing schedule has, because of lack of explicit attention to spatial configuration and analysis biased towards larger higher quality patches (which tend to be in higher elevation zones), not included crucial small patches in the coastal, semi-coastal and lower lowland zones. These sites are significant because they enable corridor establishment and/or are nuclei for restoration or rehabilitation of severely depleted ecosystems in these bioclimatic zones. Numerous public and private restoration projects in New Zealand attest to the value of using extant albeit modified sites as nuclei for extending the resource. In the coastal and semi-coastal bioclimatic zones where the biodiversity resource has been severely depleted a desirable goal is to enhance and extend the resource by restoration and reconstruction. To adequately protect the biodiversity resource of the Western Bay of Plenty District would require development of at least corridors from the south to the north. As can be seen from the Western Bay of Plenty District Council ecological map such opportunities are rather limited.”

[30] Dr Clarkson’s appraisal of the district’s natural resources in reference to s.6(c) considerations was thorough and convincing, both in breadth and detail. Viewed in conjunction with Ms Long’s evidence, and not overlooking that of Mr Graeme in support, we are persuaded that a case was made out for the schedule to be revised. In weighing the evidence of the witnesses on all sides, we have borne constantly in mind the Act’s single purpose of promoting the sustainable management of natural and physical resources. Section 6 matters, nationally important by prescription as they are, plainly need to be recognised and provided for in conjunction with the many other considerations contemplated by the legislation in the district planning process. It thus becomes a question of weighing all relevant matters and incorporating them within the plan’s framework in order to produce a
carefully analysed and well-balanced document for achieving the Act's purpose. This is not to say that individual aspects of sections in Part II of the Act that follow upon s.5 are bound to become submerged and lost sight of in the mix of the plan's ingredients. The sections subsequent to s.5 are designed more fully to inform and assist a body such as the Council in following through and applying Parliament's intent in achieving the Act's purpose for its district. Expressed in the reverse context, those sections are not intended to be applied as a series of competing considerations liable to undermine achievement of the purpose laid down in s.5.

[31] Mr Cooney indicated that the Council, in deference to the concerns of the Minister and the Society, was prepared to include any wetland areas deemed by Dr Clarkson to be significant as habitats of indigenous fauna and not currently scheduled. In this connection, we gather that the reference to wetlands in s.6(a) of the Act was in the Council's mind along with s.6(c). We were nevertheless given to understand that the Council believes that all relevant wetland areas have already been included in the schedule. Be that as it may, we consider that, additionally, with the Council having adopted the "scheduling method" for the protection of significant sites, the 51 sites earlier alluded to, acknowledged as having a "high" or "moderate high" level of significance, should be added to the schedule by way of notified variation. If there is any modification to that list, either by way of further addition or necessary deletion for some reason, on which the Council and other parties are agreed, the variation may allow for that accordingly. As to the further 14 sites propounded by DoC, we consider that such of those that Dr Clarkson considers significant for protection under s.6(c) should be added as well. On the foregoing footing, we conclude that the schedule will be rendered suitably comprehensive for land use planning purposes at this point.

[32] Differing views will doubtless persist between the Council, other agencies, and individuals that additional sites ought to be listed. On the other hand, those landowners whose properties are affected by the variation will have the opportunity to be heard as to their individual views and concerns. As a matter of judgement on the evidence presented, we conclude that the above course of action is appropriate - accepting, as we do, the broad thrust of the appellants' cases concerning the schedule's present content. If there should be any difficulty in settling the list of additional sites to be included in the variation, leave is reserved to apply. Again, if any other associated issue should require the Court's adjudication or assistance, leave to apply is likewise reserved.
[33] We by no means overlook or decline to attach weight to the views advanced for the Council through Mr Slaven and Mr Martelli, and by other witnesses such as Mr Roberts. We are fully mindful of their opinions as to the appropriateness of the Council’s stance, based on their perception of “no real threat” and the current scheduling of prime sites within the district. In the “no threat” connection, we acknowledge that there has been a remarkable absence of incidents of damage or destruction coming to the Council’s notice in the recent past. That has been laudable, and may well be a reflection of the Council’s worthwhile endeavour to foster and encourage a conservation ethic or attitude of responsibility amongst the rural community. We accept too that the protection lot/TDR provisions have proved, and will continue to be, a positive incentive.

[34] Yet if, as stated, a committed approach to the protection of indigenous flora and fauna has become embedded and widespread in the public mind, it does not seem to us inconsistent with that accepted notion, or level of recognition, for the schedule to be revised in the manner indicated. As rural lifestyle pressures continue to exert themselves, with an accompanying and continuing demand for subdivision and closer density development, those areas and habitats of indigenous flora and fauna that remain within the district carry commensurate significance.

[35] In planning terms, and applying the criteria specified in the oft-cited case of Nugent Consultants Limited v Auckland City Council [1996] NZRMA 481, we find that it is necessary (in the sense of being desirable) that the protective element be furthered by listing additional sites in the schedule (supported by the plan’s inter-related policies, objectives and rules). We also find that expansion of the schedule into a state of comparative comprehensiveness is the most appropriate means in the circumstances for approaching the need for provision in the plan for the protection of significant areas and habitats of indigenous vegetation and fauna in the context of the Act’s purpose. That is so on account of that method having already been adopted and endorsed for the significant sites currently listed, and against the background of the district’s marked and seemingly inexorable bio-diversity decline underlined by Dr Clarkson. Such an approach will also assist the Council in carrying out its function of controlling actual and potential effects in order to achieve the Act’s purpose. It will also have a purpose of achieving the plan’s objectives and policies with particular reference to Section 9 of the plan.
Plainly the scheduling process is not, and cannot be, the complete answer. Rather, it must be seen as part (albeit an important part) of the raft of mechanisms that the Council has very commendably taken on board - designed, each in its own way, to assist fulfilment of those environmental considerations under s.6(c) to which Parliament has ascribed national significance. It is not a matter of choice between processes, but a case of suitably recognising via a combined approach the need for sustainable management (as defined by the Act) in the context of protecting areas of significant indigenous vegetation and habitats of indigenous fauna. Viewed overall, these natural resources are susceptible to continuing pressure towards further reduction rather than augmentation and enhancement. Given the abundance of such resources in decades past, what exists now is comparatively a remnant.

We do not overlook the evidence of Mr Martelli that a very substantial portion of known documented ecological features of the district is under some form of protection or another, whether by formal or informal means. Even so, in the light of the evidence called for the appellants, particularly that of Dr Clarkson, an approach geared to a more comprehensive scheduling process in conjunction with the other voluntary and educational mechanisms and incentives that the Council seeks to promote, is justified to achieve the Act's purpose. We bear in mind too that, although many higher-lying parts of the district are protected by voluntary covenant and the like irrespective of the plan's provisions, Dr Clarkson expressed particular concern about protection of ecological sites of significance in middle and lowland areas of the district. That concern as we recall stemmed from the perceived importance of seeking to enhance biological diversity by developing "biological corridors" by virtue of wildlife and other natural interconnections between sites, linking in turn with the coastal area.

We turn to the Society's case concerning prohibition of stock grazing within scheduled areas and the issue of native forest logging. As to stock grazing, it was common ground that the inclusion of stock within areas intended for protection is a matter of concern. However, on the basis of the educational and other steps taken by the Council as explained by Mr Martelli, we are not persuaded that a pattern of poor farming practice is prevalent as to warrant the blunt planning approach of blanket prohibition proposed by the Society.

Mr Martelli had this to say (paragraph nos. omitted):
The extent of the problem or the degree of threat has not been identified by the appellant.

To my knowledge, stock in the Western Bay of Plenty District are only let into fenced off areas in very isolated cases as follows:

(a) for shelter purposes eg when the Proposed Plan was notified in 1994 a severe cold snap affected the area, including snow. I am aware of one farmer who let some of his stock into a fenced off area of his farm for protection from the weather. The stock were there for their own health and safety from the weather, not from a feed perspective, and it was only for a short period of time.

(b) some farmers let stock in to "clean up the bush" ie get rid of the weeds and rubbish as they see it.

Such a rule as proposed by the appellants can only apply in the practical sense to fenced off areas. Those that are not fenced off must be automatically assumed to have existing use rights.

Furthermore, because of existing use rights, the rule can only apply to fenced off sites that have not been used for grazing of any type at any time in the past. The non-existence of existing use rights is virtually impossible to prove.

The majority of these sites are at the backs of farms and monitoring therefore becomes impractical.

It is my opinion that the most damage would be caused by the practice of "cleaning up" referred to in 3.2(b) above. The occasional farmers who do this genuinely believe they are doing the bush a favour. What is needed to stop this practice is education: education about the effects on regeneration, root damage, loss of habitat for wildlife.

The District Plan lists education as a method, and some action has occurred. A joint education programme was undertaken in 1998 to inform and educate landowners about the values of the feature and appropriate management practices. This programme was initiated by DOC and was supported by my Council, Environment BOP and QEII and was in the form of a newsletter. Federated Farmers also have shown a willingness to be involved with DOC and Forest & Bird in organising field days to cover areas of concern to farmers and conservationists. Further methods are proposed in the Environmental Education Strategy currently being developed.

In summary the proposed rule is fraught with difficulties. It is impractical and will not achieve the outcome sought. Education is considered to be far more effective and is also cost-effective compared to the rule. The rule does not pass the Section 32 test, whereas education does.

[40] On reflecting upon the Society's case, we accept the above summation and conclusions against the background of the Council's emphasis upon community education, and the positive steps in that direction to date. We acknowledge the potential for damage by stock grazing where a landowner declines or neglects to fence off an ecologically sensitive area, and is otherwise lax in the farming management practices employed vis-à-vis the environment. However, on the
evidence before us, we are not satisfied that the level of concern is such as to warrant introducing an “across the board” exclusionary rule as sought by the Society. We agree with Mr Martelli that the Council would inevitably be faced with marked practical difficulties in undertaking enforcement measures. Nevertheless, we would expect the Council to maintain surveillance on the effectiveness of its educational approach during the planning period, and to review that approach should it emerge that damage through grazing is producing an appreciable adverse effect within the district militating against the protection objective.

[41] As to native forest clearance and logging, we agree with the Society that native forest logging under the Forest Amendment Act 1993 should not be a permitted activity in Section 9 of the Plan. We need only refer to and adopt the detailed analysis of this Court (differently constituted) in Minister of Conservation and Others v Southland District Council (Decision A039/01) where it was found that sustainable management under the Resource Management Act is quite different from sustainable forest management under the Forest Amendment Act. It was also pointed out that the former Act expressly provides that compliance with it does not remove the need to comply with other applicable legislation. It was therefore held that Parliament’s intent is that that Act and the Forest Amendment Act should stand together and each take effect on its own terms (p.23). Hence, as was pointed out (at p.22):

As an activity, milling of forest products might be controlled under the (Resource Management) Act, but that control would be for the wider purpose of promoting sustainable management of natural and physical resources generally, with particular reference to external effects of the activity itself, not for the sustainability of the source forest.

[42] Adopting and applying the foregoing reasoning, we direct that native forest logging under the Forest Amendment Act 1993 be deleted as a permitted activity in Rule 9.3.1 of the plan.

[43] Turning finally to the deer and goats issue, we acknowledge the genuineness of the Society’s concern over the potentially destructive effect of these animals upon significant indigenous forest areas within the district. The well-prepared evidence called for the Society from Mr Jaques and Mr O’Reilly-Nugent especially was supportive of the relief sought as to a proposed 2km exclusionary or separation area between major areas of indigenous forest and deer and goat farming activities. On balancing that, however, against the evidence adduced for the Council, along with
that of Mr Roberts and other submitters in support, we consider that the following points raised by Mr Martelli bear merit:

1. Existing use rights would create administrative difficulties. Locations of existing farms would need to be documented along with the number of stock. Monitoring would also need to be carried out. The costs are likely to outweigh any benefits.

2. There is already existing legislation to control farming of such animals notably the Conservation Act, Wild Animal Control Act, Fencing Act, Stock and Impounding Act and the Regional Council's Pest Management Strategy. It is insufficient and unnecessary to introduce yet another level of controls when techniques already exist.

3. Education is a viable option. This would include management practices such as animal husbandry and construction and maintenance of fences. Education of the consequences of escaped animals is also important whether it be about potential impact on the environment or enforcement action against the owner.

[44] In summary, Mr Martelli's view was that the relief sought by the Society is not justified from a benefit/cost perspective because of the difficulties of distinguishing between existing use and non-existing use situations, and the need for ongoing monitoring and administration with attendant expenses to the Council. He concluded that the Council's resources would be more effectively spent on techniques that the Council has already made good headway in promoting, such as grants for fencing and education.

[45] We consider it significant that the Minister did not choose to become associated with the Society's bid for relief on the deer and goats aspect. Evidence for the Council indicated that problems created by the escape of either species are not significant. Rather, areas elsewhere within the Bay of Plenty are distinguishable in terms of the size of any problem from Western Bays. In the latter district we accept that the incidence of deer and goats escaping from farms into major forest areas is relatively limited and under control. Various reasons were advanced for that, but we perceive no need to make a definitive finding as to whether any one is predominant or whether the true position reflects various contributing influences.

[46] Apart from the 2km exclusion suggestion, there was evidence for the Society recommending that the plan provide for electrified fencing for goats in particular. Weighing that evidence alongside that for the Council and others in opposition, we are satisfied that, for the present and immediate future at least the need for more costly "higher standard" fencing is not made out. Rather, we accept the position proffered by Mr Martelli for the Council in these terms:
Notwithstanding, Council is prepared to include fencing standards in the District Plan's Activity Performance Standards for permitted activities throughout the whole of the Rural G & H Zones (which would include deer and goat farming). The proposed standards would be as follows:

**Goats (minimum)**

1. Bulldozed line.
2. 9 wires (kept tight at all times).
   - minimum high tensile 2.5mm diameter galvanised steel
   - bottom wire should be placed 80mm above ground level and, above that, wires placed at following intervals – 100, 100, 100, 110, 120, 135, 130 and 165mm. The top wire should be approximately 50mm below the top of the post.
3. No internal stays.
4. Posts to be at the following spacings:
   - Less than 30° ground slope 5m
   - 30° to less than 45° 4m
   - 45° or more 3m
5. Battens to be at 1m intervals

**Deer (minimum)**

As specified in the Deer Farming Notice of the Wild Animal Control Act

[47] We direct that the plan incorporate the foregoing performance standards as the Council proposes. Here again, we would expect the Council to monitor the situation during the planning period and review the plan’s approach if the incidence of goats and/or deer escaping should alter to the detriment of indigenous forest areas.

[48] As to the plan variation earlier discussed, we would expect the revised schedule to be notified without delay, given the delay already occasioned since the adjournment of the proceedings at the end of 1996 (which was granted so that the Council could confer with DoC with a view to revising the schedule well before now). We would also expect the variation to contain a provision indicating that the schedule will be kept under continuing review and amended from time to time in order that the Act's intent may be met with particular reference to section 6(c).

[49] We add that this decision is delivered on an interim footing in deference to the Council’s plea that it be offered the opportunity of amending and expanding the schedule, rather than have a form of regulatory back-up control introduced in the plan. Inasmuch as the scheduling process cannot guarantee that every significant site
that should be listed in terms of paragraph (6)(c) is in fact listed, we have, in effect, accepted and relied on the Council's assertions as to the effectiveness of the additional methods aimed at protection (including the programme of education, voluntary mechanisms, and introduced incentives). Even so, we expect the Council to monitor the situation carefully regarding indigenous bush preservation/clearance trends during the plan's operation and take timely steps to change the plan should the need become apparent. Moreover, the intended plan variation ought appropriately to contain a clear statement that non-listing within the schedule is not to be taken as meaning that an area of indigenous vegetation or habitat of indigenous fauna is not environmentally important or worthy of protection. On the contrary, bearing in mind the district's depleted resources, native bush areas or wildlife habitats that in yesteryear would have seemed of little moment (given their prevalence) have a present and future significance that must not be under-rated.

[50] As a footnote, we observe that a consent order is proposed as to certain other issues that were not the subject of contention and argument before us. We invite counsel to submit such order in final form within 20 working days, incorporating any refinements that may be agreed on consequent upon receipt of this interim decision.

**Determination and Costs**

[51] Consistent with the Court's normal practice in plan reference cases, we propose that costs lie where they fall, unless an application from any quarter is received within 15 working days in which case a timetable for receipt of submissions will be set.

**DATED** at AUCKLAND this **3rd** day of **August**, 2001.

For the Court,

[Signature]

R J Bollard
Environment Judge
BEFORE THE ENVIRONMENT COURT

Decision No. [2015] NZEnvC 105

IN THE MATTER of an appeal pursuant to clause 14(1) of Schedule 1 of the Resource Management Act 1991 (the Act) in relation to proposed changes to the Waikato Regional Policy Statement

BETWEEN OPOUTERE RATEPAYERS AND RESIDENTS' ASSOCIATION (ENV-2012-AKL-000253)

Appellant

AND WAIKATO REGIONAL COUNCIL

Respondent

Hearing at: at Hamilton, 23 October 2014; 18 November 2014
and site visit on 19 November 2014
Respondent’s closing submissions filed 14 December 2014

Court: Environment Judge M Harland
Environment Commissioner O Borlase
Environment Commissioner K Edmonds

Appearances: Mr M Lloyd for the appellant.
Mr J Milne and Mr S Plant for the respondent.

Date of Decision: 9 June 2015
INTERIM DECISION OF THE ENVIRONMENT COURT

A. The appeal is allowed in part. The following areas are to be identified in the proposed RPS:

(a) The mapped area identified by Mr Kessels in Exhibit 3 is to be included in the proposed RPS as an area of ecological significance (or similar nomenclature), including any explanation thought necessary (see paragraphs [105] to [107]; and

(b) The ocean beach and spit (with the specific area to be later defined) is to be included in Table 12-1 of the proposed RPS as an ONFL.

B. The parties are to confer and provide the Court with the appropriate maps to accord with this decision by 7 July 2015.
Introduction

Opoutere

Overview of relevant legal provisions and planning instruments

The Act

The Hauraki Gulf Marine Park Act 2000

The relevant planning instruments

The NZCPS

The Waikato Regional Coastal Plan

Should Opoutere be included as an area of ecological significance in the proposed RPS by mapping or otherwise specifically identifying it as such?

The ecological significance of Opoutere

The arguments and the issues

Does the NZCPS require the site to be identified to protect its ecological values, and if so, does this require mapping or something else?

The proposed RPS provisions

Do the above proposed RPS provisions meet the requirements of the NZCPS in relation to the site?

Sustain Our Sounds argument

Department of Conservation Guidance Notes

Does Policy 7(1) (b) apply to Regional Plans only?

Conclusion

If the site was identified (by mapping or otherwise) in the proposed RPS would this result in an unusual planning outcome and if so, does this matter?

Are the provisions of the Coastal Plan sufficient to protect the site and if so, does this mean it does not need to be more specifically identified in the proposed RPS?

NCZPS 2010 preceded the Coastal Plan

Coastal Plan identifies different area than that sought by ORRA

Conclusion

Overall conclusion

Should Opoutere be identified as an ONFL?

The NZCPS

ONF, ONL or ONFL?

What parts of the landscape should be assessed?

Does all or part of Opoutere qualify under the assessment criteria as an ONFL?

The proposed RPS provisions
The earlier landscape assessments ........................................... 55
The Buckland report .............................................................. 56
The Coromandel Peninsula assessment .................................... 58
Mr Brown’s involvement in the proposed RPS .......................... 59
Finding .................................................................................. 61
The application of the assessment criteria by the experts .......... 62
Physical Attributes ................................................................. 62
Aesthetic Attributes ............................................................... 65
Associative Attributes ............................................................ 67
Other matters ....................................................................... 69
Are the landscape values at Opoutere outstanding? ................. 70
Is Opoutere (part or all of it) regionally significant? ................. 73
Conclusion ........................................................................... 75
Overall conclusion ............................................................... 76
REASONS FOR DECISION

Introduction

[1] This is an appeal by Opoutere Ratepayers and Residents Association ("ORRA") against the decision by the Waikato Regional Council ("the Council") to refrain from specifically including Opoutere as an area of ecological significance and an outstanding natural feature and landscape ("ONFL") in its proposed Regional Policy Statement ("the proposed RPS"). The Council accepts that Opoutere is an area of ecological significance that requires protection, but it contends that it is not required to specifically identify it by mapping because it has provided criteria and other implementation methods for the assessment of such areas in the proposed RPS, and this, together with part of it being mapped as an area of significant conservation value ("an ASCV") in the Waikato Regional Coastal Plan are sufficient to protect it. The Council also contends that Opoutere does not qualify as an ONFL. This appeal raises important questions about the interpretation of the New Zealand Coastal Policy Statement 2010 ("the NZCPS") and what is required to give effect to its objectives and policies in a proposed RPS. The issues for us to determine are:

(a) Should Opoutere be included as an area of ecological significance in the proposed RPS by mapping or otherwise specifically identifying it as such? and

(b) Should Opoutere be included as an ONFL in the proposed RPS in Table 12-1 (the accompanying Map 12-1A: Overview, and as a specific regional scale map)?

[2] We have decided that Opoutere should be identified as an area of ecological significance within the proposed RPS in accordance with the area defined by Mr Kessels within the blue line on Exhibit 3, but we have determined that only part of it (the ocean beach and spit) qualifies as an ONFL. This decision sets out our reasons for reaching these conclusions.

[3] We commence with a description and the spatial definition of Opoutere and the decision against which this appeal is made. We then provide an overview of the relevant legal and planning instruments that apply, followed by our detailed analysis of the two issues outlined above, understanding that within each of them there are a number of sub-issues that need to be determined.
Opoutere

[4] When we speak of Opoutere in this decision, we are referring to an area north of Whangamata Harbour and south of Tairua Harbour on the Coromandel Peninsula that includes not only the settlement of Opoutere, but also Wharekawa Harbour and Opoutere Ocean Beach.

[5] Opoutere Ocean Beach is an undeveloped white sand beach that does not have close settlement immediately behind it. In a Court of Appeal decision concerning the area in 1989, it was described as one of only two major such beaches on the Coromandel Peninsula. The northern end of the ocean beach is known as Ohui, and situated there are the Ohui Bluffs and Motuhua Rock. At the southern end of the ocean beach, there is a sand or distal spit and the mouth of the Wharekawa Harbour. Hikunui Island is situated just out from the estuary mouth, and across from it is the Ruahiwihiiwi Headland.

[6] The ocean beach includes a dune corridor with a maritime pine backdrop. There is no vehicular access to or near to the beach, and access to it on foot is gained by traversing a footbridge over part of the estuary to the sandspit. From there, there are access tracks through the maritime pines to the dunes and on to the beach.

[7] The estuary is overlooked by Maungaraawahine, a striking conical, bush-covered landform. The hills around the harbour include bush areas, production forestry and farmed areas near the harbour and its mouth. The small Opoutere settlement fronts onto the western side of the harbour/estuary.

[8] The estuary also comprises wetlands of national significance. The wetland (including the sandspit) has, since 1967, been a gazetted wildlife refuge under the Wildlife Act 1953. It is the only wildlife refuge in the Coromandel area.

[9] The avian values at Opoutere are nationally significant and it is also a significant habitat for indigenous fauna. Of the 43 native bird species that can be found at Opoutere, 21 (or 49%), are currently threatened or at risk. It is the single

---

1 Opoutere Residents & Ratepayers Association v Planning Tribunal 13 NZTBA 446 [CA] page 447, the other being New Chums Beach
2 Now an Outstanding Natural Feature (an ONF) in the proposed Thames-Coromandel District Plan
4 Dr Dowding, Tab F(6), page 160, paragraph [14]
5 Ibid, Tab F(6), page 159, paragraph [13] and Table 1, page 160 "EB"

ORRA (Decision) Combined
most important site in the Waikato Region for the threatened New Zealand Dotterel.\textsuperscript{6} We will say more of this shortly, although it was accepted by the Council that Opoutere (as it is defined by Mr Kessels within the blue line on Exhibit 3) is an important area of ecological significance.\textsuperscript{7}

The decision subject to appeal

\textsuperscript{[10]} The context of this appeal is the Council’s formulation of its second Regional Policy Statement which was notified in November 2010. Submissions in relation to the proposed RPS closed on 28 February 2011, and the appellant made such a submission.\textsuperscript{8} The appellant’s submission was fulsome, and attached to it a number of documents and reports including:

- a map of the area it proposed to be protected,\textsuperscript{9}
- a copy of the Court of Appeal decision in 1989 referred to above,\textsuperscript{10}
- a report by Dr Dowding,\textsuperscript{11}
- an Assessment of Environmental Effects: Mangrove Seedling Control Wharckawa Harbour, July 2009 by Catherine Beard,\textsuperscript{12}
- the Table from the Waikato Regional Coastal Policy Plan identifying Opoutere Sandspit and Wharekawa Harbour as an ASCV,\textsuperscript{13}
- Appendix B from the Council’s resource consent application in respect of mangroves identifying indigenous flora and fauna (native birds and fish) in the area,\textsuperscript{14}
- a report from Dr Nicholson, a retired physician, also a member of the New Zealand Ornithological Society and homeowner in the area for approximately 36 years, which speaks of the wider ecology and values of the area,\textsuperscript{15} and

\textsuperscript{6} Dr Dowding, Tab F(6), page 165, paragraph [30]
\textsuperscript{7} Mr Milne, Closing submissions, paragraph [32]
\textsuperscript{8} Dated 25 February 2011
\textsuperscript{9} Tab 1 to the submission
\textsuperscript{10} Tab 3 to the submission
\textsuperscript{11} Tab 4 to the submission
\textsuperscript{12} Tab 5 to the submission
\textsuperscript{13} Tab 6 to the submission
\textsuperscript{14} Tab 7 to the submission
\textsuperscript{15} Tab 8 to the submission
a report from Louise Furey, an archaeologist, noting a number of significant archaeological sites for tāngata whenua and pakeha.\textsuperscript{16}

Hearings about the proposed RPS were held between 13 February and 7 June 2012 and the hearings committee comprised some independent commissioners and some regional councillors. Their decision, which was the decision of the Council, was publicly notified on 2 November 2012 and was recorded in a Table format. The applicants submission was dealt with in the following way:

\begin{quote}
\begin{tabular}{|l|p{0.8\textwidth}|}
\hline
[166.1] & Opoutere Residents & Ratepayers Association Inc requests amendments to the proposed RPS to expressly identify Opoutere as an area of significance. \\
Decision: & Reject \\
Further submission: & Rayonier NZ Limited 63.61 opposes submission: \\
Decision: & Accept \\
Reasons: & The committee does not accept the submission point, which is addressed in more detail in other decisions for this submitter relating to chapter 12 (Landscape, Natural Character and Amenity). \\
\hline
\end{tabular}
\end{quote}

\begin{quote}
\begin{tabular}{|l|p{0.8\textwidth}|}
\hline
[166.2] & Opoutere Residents & Ratepayers Association Inc requests to add Opoutere to Table 12-2 \\
Decision: & Reject \\
Further submission: & Rayonier NZ Limited 63.61 opposes submission: \\
Decision: & Accept in part \\
Reasons: & The committee considered the evidence of the landscape architect and concluded that Opoutere generally did not fit the criteria used as the basis for identifying regionally significant ONFLs. However, the committee draws the submitter’s attention to the criteria in section 12 that should be used as the basis for district level ONFL identification. \\
\hline
\end{tabular}
\end{quote}

Mr Milne described the decision of the Council as \textit{bare-boned}.\textsuperscript{17} He submitted that the decision of the Council was not to reject Opoutere as an area of ecological significance, but to reject the request to \textit{expressly identify} it as such.\textsuperscript{18} We do not agree that the decision of the Council is clear on this point. In our view, the Council’s decision could easily be interpreted as rejecting the appellant’s request to expressly identify Opoutere as an area of ecological significance, because it is not ecologically significant.

Given the quality and depth of the submission made to it by ORRA, the brevity of the decision is surprising. In relation to the submission that Opoutere be included as an ONFL, only the barest of reasons for the Council’s decision are provided, with no attempt having been made to analyse the material put before it by

\textsuperscript{16} Tab 9 to the submission  
\textsuperscript{17} Mr Milne, Closing submissions, paragraph [13], referring to the evidence of Mr van Voorthuysen, evidence-in-chief, Agreed Bundle of Documents, page 140  
\textsuperscript{18} Mr Milne, Closing submissions, paragraph [14]
ORRA. In relation to the listing of the area as one of ecological significance there are no reasons given for the decision, in fact the committee seems to have conflated the ONFL part of ORRA’s submission with its request for Opoutere to be identified as an area of ecological significance and assumed that they are the same.

[14] Under s290A of the Act we are required to have regard to the decision under appeal. Because of what we have outlined above, we are unable to give the Council’s decision any weight whatsoever. Mr Milne submitted that any deficiencies in the decision-making process have now been cured on appeal. We accept that is the case; however ORRA was justified in expressing concern about the way that its submission was determined in the first instance.

Overview of relevant legal provisions and planning instruments

The Act

[15] The starting point is the Act and its purpose, which is to promote the sustainable management of natural and physical resources.19 Within the definition of sustainable management contained in s5(2), for Opoutere and in the context of this appeal, the focus is on the protection of natural and physical resources, safeguarding the life-supporting capacity of ecosystems20 and avoiding any adverse effects of activities on this environment.21

[16] Sections 59-62 of the Act specifically apply to regional policy statements. Not surprisingly, the purpose of a regional policy statement is to achieve the purpose of the Act, and it does this in two ways:

(a) by providing an overview of the resource management issues of the region

(b) by providing policies and methods to achieve the integrated management of the natural and physical resources of the whole region.22

[17] Whilst s59 of the Act only refers to policies and methods, it is clear from s62 (which is entitled “Contents of regional policy statements”) that such a document

---

19 s5(1)
20 s5(2)(b)
21 s5(2)(c)
22 s59
must (among other things) state the objectives sought to be achieved by the statement, an explanation of the policies and methods (excluding rules) used, or to be used to implement the policies. Whilst a policy cannot be a "rule" it may nevertheless have the effect of what in ordinary speech would be a rule.

[18] As well, the principal reasons for adopting the objectives, policies and methods of implementation set out in the statement must be stated and the environmental results anticipated from implementing those policies and methods. The regional policy statement must state the local authority (defined in s2 as a regional council or territorial authority) responsible in the whole or any part of the region for specifying the objectives, policies and methods for the control of the use of land to maintain indigenous biological diversity.

[19] A regional policy statement must also state the procedures used to monitor the efficiency and effectiveness of the policies or methods contained in the statement. Importantly, the regional policy statement must give effect to the NZCPS. "Give effect to "simply means "implement," and what is required will depend on what is being given effect to. The Supreme Court has said that a requirement to give effect to a policy that is framed in a specific and unqualified way (that is, which creates "an environmental bottom line") may in a practical sense be more prescriptive than a requirement to give effect to a policy which is worded at a higher level of abstraction.

[20] As outlined above, this proposed RPS was notified in November 2010, prior to the NZCPS coming into force on 3 December 2010.

[21] The Council is required to amend a document to give effect to any provision in a national policy statement that affects the document. The proposed RPS is clearly such a document. Any amendments to the proposed RPS that are required by

---

23 s62(1)(c)
24 s62(1)(d)
25 s62(1)(e)
26 Environmental Defence Soc Inc v the New Zealand King Salmon Co Ltd [2014] NZSC 38
27 s62(1)(f)
28 s62(1)(g)
29 s62(1)(h)(iii)
30 s62(1)(j)
31 s62(3)
32 Environmental Defence Soc Inc v the New Zealand King Salmon Co Ltd [2014] NZSC 38 at paragraph [80]
33 s55(2B)

ORRA (Decision) Combined
the proposed NZCPS 2010 are to be made as soon as practicable.\textsuperscript{34} As well, the promulgation of regional policy statements is governed by Schedule 1 of the Act, with the result that the provisions of s32 concerning evaluation reports also apply.\textsuperscript{35}

[22] The proposed RPS was subject to a number of appeals, ten (10) of which related to the provisions concerning indigenous biodiversity (relevant to whether or not Opoutere should be identified as an area of ecological significance) and eight (8) of which related to the provisions concerning landscape (relevant to whether or not Opoutere should be identified as an ONFL). The parties to the appeals on these topics have resolved them amongst themselves and have submitted draft consent memoranda to the Court. These draft consent orders are still subject to the Court’s final approval, but it is fair to say that the Court’s queries relate more to drafting issues than to substance. For this reason the proposed provisions that will be referred to in this decision will identify the changes to them by strike out or underline. We have decided to give the proposed changes considerable weight. No party suggested that we should do otherwise.

\textit{The Hauraki Gulf Marine Park Act 2000}

[23] The Hauraki Gulf Marine Park Act 2000 covers the Opoutere area. Counsel for the appellant drew to our attention section 7(1) of that Act, which declares that the interrelationship between the Hauraki Gulf, its islands, and catchments and the ability of that interrelationship to sustain the life-supporting capacity of the environment of the Hauraki Gulf and its islands are matters of national significance.

[24] Section 8 of the Act deals with the management of the Hauraki Gulf and sets out its objectives, one of which is to protect, and where appropriate enhance, the life-supporting capacity of the environment of the Hauraki Gulf, its islands and its catchments.

[25] That Act requires that its sections 7 and 8 must be treated as a New Zealand coastal policy statement issued under the RMA and if there is a conflict between these provisions and the provisions of the NZCPS, the NZCPS prevails.\textsuperscript{36} No party suggested that was there was such a conflict.

\textsuperscript{34} s55(2D)(a)
\textsuperscript{35} s55(2C), sch 1 cls 5(1)(a), 10(2)(ab)
\textsuperscript{36} s10(2)
[26] Mr Lloyd submitted that the Hauraki Gulf Marine Park Act creates a strong presumption in favour of identification of special areas within the Hauraki Gulf coastal environment. We do not agree that the Act necessarily creates such a presumption – we did not receive sufficient argument on the point to properly determine this – but certainly sections 7 and 8 must be considered by us as in our evaluation.

The relevant planning instruments

The NZCPS

[27] As we have outlined, the proposed RPS must give effect to or implement the NZCPS. In relation to the argument that Opoutere should be identified as an area of ecological significance, Objective 1 and Policies 7 and 11 of the NZCPS are particularly relevant. In relation to whether or not Opoutere should be identified as an ONFL Objective 2 and Policies 7 and 15 of the NZCPS are particularly relevant. While Policy 1 is important for both issues as it defines the coastal environment, the proposed RPS (Maps 4-17 and 4-18) shows the Opoutere area we are considering is within the coastal environment.

[28] We recognise that there are other provisions in the NZCPS that refer or relate to ecological values. For example, Policy 3(2)(b) refers to adopting a precautionary approach to the use and management of coastal resources potentially vulnerable to effects from climate change so that natural adjustments for ecosystems, habitat and species are allowed to occur; Policy 5(1) refers to avoiding adverse effects of activities that are significant in relation to the purposes for which land or waters are held or managed under other Acts (such as the wildlife refuge here); and Policy 6(j) refers to buffering areas and sites of significant indigenous biological diversity where appropriate. As well, Objective 6 recognises the proportion of the coastal marine area under any formal protection is small and therefore management under the Act is an important means by which the natural resources of the coastal marine area can be protected. We mention these provisions by way of completeness, even though they were not focussed on in argument.

[29] An issue arose as to whether or not Policy 13, which deals with the preservation of natural character, was relevant. We agree with Mr Milne that neither ORRA’s original submission, nor its Notice of Appeal, deal with the matter of natural

37 Transcript, page 18, lines 19 – 24
character, and for this reason we agree with him that Policy 13 is not directly relevant. It is, however, relevant by way of analogy as for example the wording of Policy 13 was compared to Policies 7 and 11 in the context of whether or not mapping of an area of ecological significance was required by the NZCPS. Policy 13 will, therefore, be referred to in this decision on that basis.

[30] We will undertake our analysis of each of these provisions in the context of the specific issues on appeal.

The Waikato Regional Coastal Plan

[31] The provisions of the Coastal Plan were referred to in the context of the argument about whether or not Opoutere should be identified as an area of ecological significance. This arises because Appendix 4 identifies it as an ASCV, and the Council’s argument is that because of this and the policies and rules, there is no need for Opoutere to be separately identified or mapped in the proposed RPS.

[32] Whether or not the above listing and the policies and rules in the Coastal Plan are sufficient to protect the significant ecological values present at Opoutere will be covered in more depth in our analysis.

Should Opoutere be included as an area of ecological significance in the proposed RPS by mapping or otherwise specifically identifying it as such?

[33] There was no dispute that the area defined by Mr Kessels within the blue line in Exhibit 3 is an area of national ecological significance in so far as its avian values are concerned. If it is an area of national ecological significance for this reason, then it follows that it is of regional significance for the same reason.

[34] Neither was there any dispute that the area defined by Mr Kessels met several of the criteria in the proposed RPS (only one need be met) to qualify as an area of significant indigenous biodiversity. In his evidence-in-chief Mr Kessels had evaluated the area proposed by ORRA for inclusion in the maps against the ecological significance criteria contained in Section 11A of the proposed RPS as amended. He assessed the values of the Wharekawa Harbour and Opoutere beach as one contiguous system and considered the area met eight of the eleven criteria.

---

36 ASCV 24, Appendix iv, Coastal Plan
37 Mr Kessels, evidence-in-chief, paragraph [24]
Whilst in most cases such agreement would mean that it was no longer necessary to traverse the subject, given the importance of the area we consider it helpful to highlight some of the key aspects of the evidence which lead to that conclusion.

**The ecological significance of Opoutere**

In this decision we refer to the "ecological values" at Opoutere, which as is evident from what we have already said, are significant and also bring into play s6(c) of the Act.

Dr Dowding, an eminent independent wildlife scientist and ecological consultant, gave evidence for ORRA. Dr Dowding is an expert on New Zealand birds, particularly coastal and riverbed species. His evidence was confined to the avian values of the Opoutere area. Mr Kessels, also an ecologist, who has considerable experience in assessing sites of ecological significance on the Coromandel Peninsula, gave evidence for the Council. We note that a focus of the evidence of the ecologists was on avian values and the importance of the variety and combination of habitat available at Opoutere to support these species, which we infer has been less hampered by human development, although not entirely devoid of the potential for adverse human intervention. We also acknowledge the evidence of Mr Kessels on the key ecological values and their ecological significance and the supporting evidence received from Mr Kessels in preparing Exhibit 3 which we will refer to shortly. We did not receive any substantial evidence about marine and estuarine aquatic ecology.

Both experts participated in joint expert witness conferencing and reached agreement on a number of important matters.

Dr Dowding and Mr Kessels agreed that the Opoutere ecological landscape comprises both the Wharekawa Harbour and Opoutere Ocean Beach together with:

- Hikutui Island;
- The distal spit;
- Motuhaua Rock;

- The harbour area and wetlands;
- The ocean beachfront and the dune corridor;
- The pine backdrop to the ocean beach;
- The hills around the harbour and related bush areas;
- The Opoutere settlement;
- Production forestry and farmed areas near the harbour and its mouth.

The experts agreed that the physical attributes of the site that make it so important for shore birds are:\(^{41}\)

- the beach and sandspit provide ideal breeding and roosting habitat for a number of threatened and at risk species;
- the inter-tidal areas of Wharekawa Harbour provide those resident birds and visiting migrants with a rich source of food;
- the area has no public roads close to the beach, or dense residential subdivision abutting the sand dune and estuarine wetland habitats, thus reducing the human and domestic animal usages of the beach, which is particularly sensitive to these disturbances during NZ dotterel nesting;
- the pine-dominated Recreational Reserve and the zoning of land behind it act as buffers to further subdivision along the beachfront; and

They agreed that this is the only important shorebird breeding site with this combination of features on the Coromandel Peninsula.

The list of native bird species recorded at Opoutere was outlined by Dr Dowding in his Table 1. He considered that the list was not exhaustive, and noted that further observations would almost certainly add to the species list for the area. He considered the secretive spotless crake may well occur in Wharekawa Harbour (as it occurs in other Coromandel east coast estuaries) and he noted that the harbour is almost certainly visited by native water fowl, e.g. grey teal, NZ shoveler and some of

the rarer migrant waders. He noted his understanding that brown kiwi are occasionally heard in Opoutere. He concluded:

...the list clearly demonstrates the very high species diversity that exists in a relatively small area.

[42] Dr Dowding, an undoubted expert on the NZ dotterel, identified Opoutere as one of six sites nationally at which full management of NZ dotterels should be undertaken annually, such a task having been categorised as essential. Somewhat obviously, the protection of habitat is of key importance to the continued success of the NZ Dotterel Recovery Plan, the first plan of which he was the author, and he is the senior author of the current plan.

[43] Dr Dowding identified Opoutere as one of ten sites of the highest importance (Priority 1 sites) during an assessment he undertook of the significance for coastal birds of sites on the east coast of the Waikato region.

[44] As outlined above, one notable feature of the list provided in Table 1 of Dr Dowding’s evidence is the remarkably high proportion of threatened or at risk species. Forty-nine percent are currently considered threatened or at risk. We consider Dr Dowding’s evidence on this point to be compelling, given that for the past nine years he has been a member of the Department of Conservation’s expert panel that assesses the threat classifications of New Zealand birds, and in 2005-2006 he was a member of the expert panel that the Department of Conservation assembled to review biodiversity provisions as part of the review of the NZCPS.

[45] Dr Dowding’s opinion was that Opoutere has outstanding avian values meaning that it applies to the highest possible category of wildlife and habitat values. His opinion was that Opoutere must be considered a significant habitat for indigenous fauna observing that the criteria upon which he based this opinion were those at an international, national and regional level. He also referred to the Coastal Plan which lists outstanding wildlife habitat as one of the conservation values for ASCV 24. In relation to international significance, he identified two out of nine criteria from the RAMSAR Convention 1971, an inter-governmental treaty promoting

---

42 Dr Dowding, evidence-in-chief, paragraph [12]
43 Ibid, paragraph [18]
44 Dr Dowding, evidence-in-chief, paragraph [2]
45 Ibid, paragraph [22]
47 Dr Dowding, evidence-in-chief, paragraph [14]
the conservation and wise use of wetlands (especially as habitat for water birds) and
the identification of wetlands of international importance,\textsuperscript{48} as applying to Opoutere.\textsuperscript{49}

[46] Mr Kessels accepted that the avian values at Opoutere are nationally
significant when assessed against the criteria contained in the proposed RPS and he
also considered them to be internationally significant when ranked against the relevant
RAMSAR criteria,\textsuperscript{50} but we note that the criteria contained in the proposed RPS do
not take the step of assessing whether the ecological values are internationally,
nationally or regionally significant. Mr Kessels fell short of describing these values as \textit{outstanding} however, because there is no assessment criterion which refers to this
terminology. Mr Kessels acknowledged that the old Wildlife Service Sites of Special
Wildlife Interest assessment criteria did use the word \textit{outstanding} to correspond to
wildlife habitats of the highest value or \textit{top tier}.\textsuperscript{51}

[47] Whilst we can understand Mr Kessels’ cautious use of this word given its
particular status within s6 of the Act, we have no hesitation in accepting Dr
Dowding’s opinion that the avian ecological values at Opoutere are outstanding
because his expertise both in terms of his qualifications and experience mean that his
conclusion about this is highly credible and reliable. In making this finding we do not
detract from Mr Kessels expertise as an ecologist, however the qualifications,
experience and knowledge of Dr Dowding about the avian values present at this and
other sites in New Zealand, are superior.

[48] We do not consider it necessary to definitively determine whether or not the
avian values at Opoutere mean that it is an internationally significant site. As outlined
above, the experts appear to have agreed that it meets two of the nine RAMSAR
criteria, but as Mr Milne rightly pointed out, it is not a RAMSAR site. We have no
hesitation in finding that the avian values at Opoutere are outstanding. They may also
be of international significance; however that is not for us to definitively determine. It
follows however, that the protection of the habitat necessary to support these avian
values is of critical importance.

[49] We also recognise that the ecological values within the significant natural
area shown on Exhibit 3 include harbour systems, dune and beach systems and
terrestrial systems. Mr Kessels depicted these systems on Exhibit 3 and explained.

\textsuperscript{48} NZ is a signatory to this as of December 1976
\textsuperscript{49} Dr Dowding, evidence-in-chief, paragraph [15]
\textsuperscript{50} Joint Expert Witness Statement: Ecology, page 2, paragraph [2]
that they are all part of the harbour ecosystem providing core habitat for important species or buffer or linkage values. He said the harbour system includes mangroves, mudflats and salt marsh rush, and the dune and beach system includes the beach, the foredune spinifex communities and the backdune dominated by pines. The terrestrial systems include the freshwater wetlands, coastal and semi-coastal forest habitats on the south side of the harbour mouth and more extensively on the north-western side of the harbour.

We accept that Exhibit 3 identifies the area at Opoutere that should be protected and we will refer to it in this decision as the site.

The arguments and the issues

Our summary of the arguments raised by the appellant is as follows:

(a) The proposed RPS did not take into account the NZCPS because it was notified before the NZCPS came into force. The proposed RPS should have been amended to accord with the NZCPS objectives and policies regarding areas of ecological significance, but it was not so amended (the s55 argument);

(b) The proposed RPS does not meet Objective 1 of the NZCPS because its provisions do not protect the site;

(c) The proposed RPS is required to identify areas of the coastal environment where particular activities or forms of subdivision, use and development are inappropriate and is required to protect from such activities through objectives, policies and methods(excluding rules), which requires something more than providing assessment criteria.

Our summary of the arguments raised by the Council is as follows:

(a) The NZCPS does not require areas of ecological significance to be mapped, which was the effect of the appellant's submission.

(b) Whilst accepting that the NZCPS requires areas of ecological significance need to be identified, the criteria for determining the significance of

52 Transcript, pages 102-103
indigenous biodiversity values outlined in Table 11-1 of the proposed RPS are sufficient to achieve this.

(c) The provisions of the proposed RPS are sufficient to protect the ecological values evident at the site.

(d) In any event, the provisions of the Coastal Plan already provide adequate protection for the ecological values evident at the site.

(e) If the site was identified (by mapping or otherwise) in the proposed RPS this would result in an unusual planning outcome.

[53] We distil these submissions into the following issues:

(a) Does the NZCPS require the site to be identified to protect its ecological values, and if so, does this require mapping or something else?

(b) Does a criteria-based approach (Table 11-1) in the proposed RPS protect the ecological values at the site, as required by the NZCPS and the Act?

(c) If the site was identified (by mapping or otherwise) in the proposed RPS would this result in an unusual planning outcome and if so, does this matter?

(d) Are the provisions of the Coastal Plan sufficient to protect the site and if so, does this mean it does not need to be more specifically identified in the proposed RPS?

[54] We now address each of these issues.

Does the NZCPS require the site to be identified to protect its ecological values, and if so, does this require mapping or something else?

[55] Objective 1 of the NZCPS (relevant to this appeal) provides:

Objective 1
To safeguard the integrity, form, functioning and resilience of the coastal environment and sustain its ecosystems, including marine and inter-tidal areas, estuaries, dunes and land by...
• protecting representative or significant natural ecosystems and sites of biological importance and maintaining the diversity of New Zealand's indigenous coastal flora and fauna… (emphasis added)

[56] Policy 1 outlines the extent and characteristics of the coastal environment and includes, relevant to this appeal, the following:

Policy 1 – Extent and characteristics of the coastal environment
...

2. Recognise that the coastal environment includes:
   (a) the coastal marine area;
   (b) islands within the coastal marine area;
   (c) areas where coastal processes, influence or qualities are significant, including ... tidal estuaries, saltmarshes, coastal wetlands, and the margins of these;
   (e) coastal vegetation and the habitat of indigenous coastal species, including migratory birds;...
   (h) inter-related coastal marine and terrestrial systems, including the intertidal zone...

[57] We have no difficulty finding on the evidence that the site is covered by the term the coastal environment (and indeed the proposed RPS maps the site as coming within the coastal environment in Maps 4-17 and 4-18) and it includes significant natural ecosystems and is a site of biological importance. The objective is therefore for the site to be safeguarded and sustained by protecting it. This objective is the goal against which is proposed must be tested.

[58] Policy 11 is also relevant. It provides:

Policy 11 – Indigenous biological diversity (biodiversity)

To protect indigenous biological diversity in the coastal environment:
(a) avoid adverse effects of activities on:
   (i) indigenous taxa53 that are listed as threatened or are at risk in the New Zealand Threat Classification System list;54
   (j) taxa that are listed by the International Union for Conservation of Nature and Natural Resources as threatened;
   (ii) indigenous ecosystems and vegetation types that are threatened in the coastal environment, or are naturally rare,55
   (iv) habitats of indigenous species where the species are at the limit of their natural range or are naturally rare;
   (v) areas containing nationally significant examples of indigenous community type, and
   (vi) areas set aside for full or partial protection of indigenous biological diversity under other legislation; and

53 Defined in the NZCPS as “named biological classification units assigned to individuals or sets of species (e.g. species, sub-species, genus, order, variety)
54 Those listed in the NZCPS are Maui’s dolphin, Hector’s dolphin, NZ fairy tern, southern NZ dotterel
55 “Naturally rare” is defined in the NZCPS as “originally rare, rare before the arrival of humans in New Zealand”
(b) avoid significant adverse effects and avoid, remedy or mitigate
other adverse effects of activity on:
(i) areas of indigenous vegetation in the coastal environment;
(ii) habitats in the coastal environment that are important during
the vulnerable life states of indigenous species;
(iii) indigenous ecosystems and habitats that are only found in the
coastal environment and are particularly vulnerable to
modification, including estuaries, lagoons, coastal wetland,
dune lands, intertidal zones, rocky reef systems, eelgrass and
saltmarsh;
(iv) habitats of indigenous species in the coastal environment that
are important for recreational, commercial, traditional or
 cultural purposes;
(v) habitats including areas and routes important to migratory
 species; and
(vi) ecological corridors, and areas important for linking or
 maintaining biological values identified under this policy.

[59] The evidence establishes that the ecological values present at the site are
covered by Policy 11(a) and (b), with the result that adverse effects or in the case of
(b), significant adverse effects on them must be avoided. The Council argues that this
is achieved in the proposed RPS by Table 11-1 and associated objectives and
policies, to which we will come shortly.

[60] Unfortunately Policy 11 does not provide any guidance on how the
avoidance of adverse or significant adverse effects is to be achieved, unlike Policies
13 and 15 (see Policy 13(c) and (d) and Policy 15 (c), (d) and (e)), but Mr Lloyd
submitted that Policy 7 must also be considered.

[61] Policy 7 provides:

**Policy 7 – Strategic planning**

In preparing regional policy statements, and plans:

(a) consider where, how and when to provide for future residential,
rural residential, settlement, urban development and other
activities in the coastal environment at region and district level,
and

(b) identify areas in the coastal environment where particular activities
and forms of subdivision, use and development:

a. are inappropriate;
b. may be inappropriate without the consideration of effects
through a resource consent application, notice of
requirement for designation or Schedule 1 of the Act
process;

and provide protection from inappropriate subdivision, use, and
development in these areas through objectives, policies and rules.

---

56 Mr Kessels, evidence-in-chief, paragraphs [42]-[43]
57 Mr van Voorthuysen, evidence-in-chief, paragraph [6.5]
[62] Policy 7 refers to certain things that need to be considered (Policy 7(1)(a)) or identified (Policy 7(1)(b) and 7(2)) in regional policy statements and plans when they are prepared. Given that Objective 1 and Policy 11 of the NZCPS require the site to be protected and adverse effects on it avoided, it follows that the site must be protected from inappropriate subdivision, use and development. This is because, somewhat obviously, the site will not be protected and adverse effects on it avoided, if there is inappropriate subdivision, use and development within it or near to it.

[63] We have no difficulty finding on the evidence that Policy 7 requires the ecological values at the site to be protected from inappropriate subdivision, use and development, the question is how this is to happen (identifying by mapping or otherwise identifying) and where this is to be achieved (in the proposed RPS or the Regional and/or District Plan/s).

[64] Mr Lloyd submitted that Policy 7 requires the Council to identify areas where particular activities and forms of subdivision, use and development are inappropriate or might be inappropriate, and provide protection from such activities through objectives, policies and rules.

[65] Mr van Voorthuysen (the planner for the Council) did not refer to Policy 7 in either his evidence-in-chief or rebuttal. Mr Lloyd put this to him in cross-examination and Mr van Voorthuysen said that the omission was deliberate. He said:

Policy 7 is an interesting policy. It's strategic planning. When I looked at this policy – I think with any policy it's important to look at the entire policy to get its context. So policy 7(1)(a) talks about future residential, rural residential, settlement, urban development etc. At the bottom of page 14 it talks about including – provide protection for these areas through objectives and policies and rules. Rules can only be in plans, not in the RPS. Policy 7(2) talks about regional policy statements and plans but the second half of (2), with the third line, "Include provisions in plans" it goes on to say, "where practicable in plans" so to me the focus of this policy in terms of its implementation is at the plan scale, rather than at the RPS level. And then I thought to myself well what, if anything, does this policy direct an RPS to do? And my conclusion was it's more a strategic growth, an urban growth strategy type policy. So, typically, this kind of policy would sit behind and help inform urban growth strategies such as the one in the Bay of Plenty called Smart Growth, for example. So that's why, when I looked at this, I didn't think it was particularly relevant to the matters that are part of this appeal.

58 Transcript, pages 120-123
Until he was cross-examined about it, Mr van Voorthuysen did not refer to the fact that Policy 7(1)(a) also refers to other activities in the coastal environment as well as future residential, rural residential, settlement, urban development. Despite having this pointed out to him, Mr van Voorthuysen still maintained that Policy 7 was primarily to do with urban development. As well, Mr van Voorthuysen did not accept that Policy 7 could, and arguably should, be interpreted with reference to other policies in the NZCPS, for example Policies 11 and 13. His view was that Policy 11 was relatively clear and self-contained.

We are mindful that ORRA did not call any expert planning witness to support its case; however whether or not Policy 7 is relevant and how it should be interpreted is a legal issue. The significant point here is that planning evidence is not necessarily required in order to interpret planning instruments. Such evidence can be helpful (bearing in mind the test under the Evidence Act is whether such evidence is substantially helpful) but the interpretation of such documents must, at the end of the day, be a matter for the Court. In our end analysis we disagree with Mr van Voorthuysen’s interpretation of Policy 7.

In our view Policy 7 is not an urban growth strategy-type policy; it is much wider than that. It deals with other activities in the coastal environment and it applies to regional policy statements and plans. Policy 7(2) deals with cumulative effects, and whilst it specifically mentions that provisions in plans should be included to manage these effects, it also requires coastal processes, resources or values that are under threat or at significant risk from adverse cumulative effects to be identified in regional policy statements, and plans.

The whole thrust of the strategic planning approach in Policy 7(1) is to provide protection from inappropriate subdivision, use and development. It is hard to see how such protection can be realised, if areas in coastal environments where such activities might be inappropriate are not identified. We agree with Mr Lloyd that Policy 7 should be interpreted alongside Policy 11.

In his closing submissions Mr Milne appeared to accept that identification of areas of ecological significance was required, but he submitted that this was achieved by adopting the criteria-based approach outlined in Table 11-1 in the proposed RPS. Mr Milne submitted that Policy 7 did not require mapping of areas of ecological

---

59 Policy 7(2)  
60 Mr Milne, Closing submissions, paragraph [76]
significance in the proposed RPS, but he contended that this was the effect of Mr Lloyd's submission.

[71] We do not agree that the effect of Mr Lloyd's submission is to equate mapping with identifying, although because of the evidence in this case that may well be the conclusion. We agree with Mr Milne that identify has a wider meaning that map and that mapping is a way of identifying something, but it is not the only way in which something can be identified. An area could be identified by words for example. Expressed another way; mapping is a subset of identifying.

[72] Although not strictly relevant to this case because Policy 13 is not directly relevant to it, this approach is consistent with Policy 13(1)(c) of the NZCPS, which in relation to the preservation of the natural character of the coastal environment and protecting it from inappropriate subdivision use and development, outlines that this can be done by mapping or otherwise identifying at least areas of high natural character. Policy 13(1)(c) and the words we have quoted tend to suggest that mapping is a subset of identifying.

Does a criteria-based approach (Table 11-1) in the proposed RPS protect the ecological values at the site, as required by the NZCPS and the Act?

[73] We first set out the relevant parts of the proposed RPS and the evidence about them, before analysing whether not they meet the requirements of the NZCPS.

The proposed RPS provisions

[74] The first important point is that the proposed RPS provisions deal with indigenous biodiversity throughout the Waikato Region, not just indigenous biodiversity in the coastal environment within the Waikato Region. The relevant provisions must be considered against this background.

[75] Mr van Voorthuysen identified the relevant provisions of the proposed RPS as Issue 1.1(d), Objectives 3.7 and 3.18, Policy 11.2, Methods 11.2.1 and 11.2.3, Section 11A and Table 11-1. We now set these out as they appear in the draft consent order.

---

61 Mr van Voorthuysen, evidence-in-chief, paragraph [5.4]
The Issue Statement reads:

Declining quality and quantity of natural and physical resources impacts their life-supporting capacity, reduces intrinsic values and ecosystem services and in general reduces our ability to provide for our wellbeing.

While addressing this issue generally, specific focus should be directed to addressing the following matters...

(d) indigenous biodiversity decline

Mr van Voorthuysen’s evidence was that Objectives 3.7 and 3.18 set out below address this issue:

3.7 Ecosystem services
The range of ecosystem services associated with natural resources are recognised and maintained or enhanced to enable their ongoing contribution to regional wellbeing.

3.18 Ecological integrity and indigenous biodiversity
Ensure the extent and the full range of ecosystem types that occur in the Waikato Region, their extent and the indigenous biodiversity that they contain those ecosystems can support exist in a healthy and functioning state.

It is surprising that given the provisions of the NZCPS and in particular Objective 1 and s55(2)(b) of the Act, that the proposed RPS contains no specific objective dealing with the protection of significant natural ecosystems and sites of biological importance in the coastal environment.

Mr van Voorthuysen’s evidence was that Chapter 11 of the proposed RPS gives effect to Objectives 3.7 and 3.18 and he identified Policy 11.2 and Implementation Methods 11.2.1 and 11.2.3 as being particularly relevant to the proceedings. These provisions provide:

Policy 11.2 – Protect significant indigenous biodiversity vegetation and significant habitats of indigenous fauna
Significant indigenous vegetation and the significant habitats of indigenous fauna shall be protected and enhanced by ensuring that the area and the characteristics that contribute to its significance are not adversely affected to the extent that the significance of the vegetation or habitat is reduced.

[Implementation Method] 11.2.1 Identify areas of significant indigenous biodiversity vegetation and significant habitats of indigenous fauna
For the purposes of identifying areas of significant indigenous vegetation and significant habitats of indigenous fauna, Waikato Regional Council will identify areas of significant indigenous biodiversity vegetation and significant habitats of indigenous fauna at the regional scale (significant natural areas) and make this information available to territorial authorities.

[Implementation Method] 11.2.3 Assess significance
Where regional and district plans require an assessment of significant indigenous vegetation, and the significant habitats of indigenous fauna
that have not been identified as significant indigenous biodiversity by Waikato Regional Council as part of Method 11.2.1, the criteria in section 11A shall be used. The identification of the characteristics of any area will be undertaken prior to any modification of the area or site and will inform the decision-making process as to whether the proposed activity or modification is appropriate. The characteristics that have contributed to an area being significant should also be communicated to the relevant landowners and kept on record by the local authority.

[80] Mr van Voorthuysen's evidence was that the Council has commenced a process of identifying and mapping areas of ecological significance, but this process is yet to be completed and had therefore not yet fully implemented Method 11.2.1. He highlighted the Explanation to the provisions which reads (2nd paragraph):

The intention is for areas of significant indigenous vegetation and significant habitat of indigenous fauna to be identified either at a regional scale by Waikato Regional Council (significant natural areas project), or as a method of managing effects through regional and district plans (method 11.2.2). It is important that regional and district plan provisions provide for the identification of additional areas, including those not identified in Method 11.2.1 which are difficult to detect at the regional scale due to limitations in technology. A diagram in section 11B summarises the significant indigenous biodiversity respective roles and responsibilities. The identification of significant indigenous vegetation and significant habitats of indigenous fauna by the Regional Council has been undertaken in accordance with 11A and Table 11-1 criteria, through district-scale vegetation mapping, assessment and review of sites, fauna and vegetation studies, scientific research, primarily as a desktop analysis to which varying degrees of confidence are assigned. Before information is included in regional or district plans further verification and validation may be required to confirm whether the identified areas meet the criteria for significance in section 11A.

[81] Mr van Voorthuysen's evidence was that it would not be appropriate to specifically identify areas of ecological significance in the proposed RPS in what he described as the general terms as is sought by ORRA, as that would go against the scheme of the proposed RPS, and the Council's intended work programme. Mr van Voorthuysen said:

Under that intended work programme the criteria in Section 11A will be used to verify and validate significant areas and significant habitats so they can then subsequently be included in regional or district plans, but not in the proposed RPS itself.

---

62 Mr van Voorthuysen, evidence-in-chief, paragraph [5.9]
63 Ibid, paragraph [5.11]
64 Ibid, paragraph [5.12]. The proposed RPS contains a flow chart describing the process to be used – see Figure 11B Significant indigenous biodiversity roles and responsibilities.
The Council’s intention is that:  

...in the future Opoutere would be assessed against the section 11A and the criteria in Table 11-1.

This statement is surprising given that the evidence of the ecologists called before us clearly establishes that the site qualifies *now* for inclusion as a significant area and habitat. It is hard to see how further assessment will add to that conclusion.

Section 11A provides as follows:

11A. Criteria for determining significant areas of indigenous biodiversity

The following criteria are to be used to identify areas of significant indigenous biodiversity and their characteristics as they exist at the time the criteria are being applied. Criteria may be specific to a habitat type including water, land or air space or may be more inclusive to address connectivity, or movement of species across habitat types.

To be identified as significant an area needs to meet one or more of the criteria identified in the table below. Areas of significant indigenous biodiversity may comprise several habitat types, including water, land and air space.

Areas of significant biodiversity shall not include areas that have been created and subsequently maintained for or in connection with:

- artificial structures (unless they have been created specifically or primarily for the purpose of protecting or enhancing biodiversity); or
- beach nourishment and coastal planting (unless they have been created specifically or primarily for the purpose of protecting or enhancing biodiversity).

Table 11-1 outlines the criteria for determining significance of indigenous biodiversity. It provides:

<table>
<thead>
<tr>
<th>Previously assessed site</th>
<th>Ecological values</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. It is indigenous vegetation or habitat for indigenous fauna that is currently, or is recommended to be, set aside by statute or covenant or by the Nature Heritage Fund, or Nga Whenua Rahui committee, or the Queen Elizabeth the Second National Trust Board of Directors, specifically for the protection of biodiversity, and meets at least one of criteria 3-11.</td>
<td></td>
</tr>
<tr>
<td>2 [Deleted]</td>
<td></td>
</tr>
<tr>
<td>2A In the coastal-Coastal Marine Area environment, it is indigenous vegetation or habitat for indigenous fauna, that has reduced in extent or degraded due to historic or present anthropogenic activity to a level where the ecological sustainability of the ecosystem is threatened.</td>
<td></td>
</tr>
</tbody>
</table>

---

65 Ibid, evidence-in-chief, paragraph [5.13]
3. It is vegetation or habitat that is currently habitat for indigenous species or associations of indigenous species that are:
   - classed as threatened or at risk, or
   - endemic to the Waikato region, or
   - at the limit of their natural range.

4. It is indigenous vegetation, or habitat or ecosystem type that is under-represented (20% or less of its known or likely original extent remaining) in an Ecological District, or Ecological Region, or nationally.

5. It is indigenous vegetation or habitat that is, and prior to human settlement was, nationally uncommon such as geothermal, chenier plain, or karst ecosystems, hydrothermal vents or cold seeps.

6. It is wetland habitat for indigenous plant communities and/or indigenous fauna communities (excluding exotic rush/pesture communities) that has not been created and subsequently maintained for or in connection with:
   - waste treatment;
   - wastewater renovation;
   - hydro electric power lakes (excluding Lake Taupō);
   - water storage for irrigation; or
   - water supply storage;
   unless in those instances they meet the criteria in Whaley et al. (1995).

7. It is an area of indigenous vegetation or naturally occurring habitat that is large relative to other examples in the Waikato region of similar habitat types, and which contains all or almost all indigenous species typical of that habitat type. Note this criterion is not intended to select the largest example only in the Waikato region of any habitat type.

8. It is aquatic habitat (excluding artificial water bodies, except for those created for the maintenance and enhancement of biodiversity or as mitigation as part of a consented activity) that is within a stream, river, lake, groundwater system, wetland, intertidal mudflat or estuary, or any other part of the coastal marine area and their margins, that is critical to the self-sustainability of an indigenous species within a catchment of the Waikato region, or within the coastal marine area. In this context "critical" means essential for a specific component of the life cycle and includes breeding and spawning grounds, juvenile nursery areas, important feeding areas and migratory and dispersal pathways of an indigenous species. This includes areas that maintain connectivity between habitats.

9. It is an area of indigenous vegetation or habitat that is a healthy and representative example of its type because:
   - its structure, composition, and ecological processes are largely intact; and
   - if protected from the adverse effects of plant and animal pests and of adjacent land and water use (e.g. stock, discharges, erosion, sediment disturbance), can maintain its ecological sustainability over time.

10. It is an area of indigenous vegetation or habitat that forms part of an ecological sequence, that is either not common in the Waikato region or an ecological district, or is an exceptional, representative example of its type.

**Role in protecting ecologically significant area**

11. It is an area of indigenous vegetation or habitat for indigenous species (which habitat is either naturally occurring or has been established as a mitigation measure) that forms, either on its own or in combination with other similar areas, an ecological buffer, linkage or corridor and which is necessary to protect any site identified as significant under criteria 1-10 from external adverse effects.
In his evidence-in-reply Mr van Voorhuyzen also provided Policy 11.4 which Dr Dowding had referred to.

**Policy 11.4 Safeguard coastal/marine ecosystems**
Protect indigenous biodiversity in the coastal environment by:

(a) avoiding adverse effects on:
(i) indigenous taxa listed as 'Threatened' or 'At Risk' in the New Zealand Threat Classification System lists or taxa listed as threatened by the International Union of Nature and Natural Resources;

(ii) habitats of indigenous species where the species are listed as Threatened or At Risk, are at the limit of their natural range, or are naturally rare; and

(iii) areas containing nationally significant examples of indigenous community types; and

(iv) indigenous ecosystems and vegetation types that are threatened in the coastal environment, or are naturally rare; and

(v) areas set aside for full or partial protection of indigenous biological diversity under other legislation.

(a) maintaining or enhancing:
(i) areas used by marine mammals and wading/coastal birds including breeding, feeding, roosting and haul-out sites (areas where marine mammals come ashore);

(ii) whitebait spawning areas and shellfish beds;

(iii) habitats, corridors and routes important for preserving the abundance and diversity of indigenous and migratory species;

(iv) indigenous habitats and ecosystems that are unique to the coastal environment and vulnerable to modification and the impacts of climate change, including estuaries, lagoons, coastal wetlands, dune lands, rocky reef systems, seagrass and saltmarsh; and

(v) habitats of indigenous species that are important for recreational, commercial, traditional or cultural purposes.

(vi) areas of predominantly indigenous vegetation in the coastal environment.

Mr van Voorhuyzen considered this Policy to be very directive and one that must be given effect to by regional and district plans.

For completeness we note the Implementation methods include the following:

11.4.1. Regional and district plans
Regional and district plans shall:

(a) protect marine habitat in the coastal marine area that has been identified as an area of significant indigenous biodiversity (Method 11.2.1....

---

66 Taxa refers to named biological classification units assigned to individuals or sets of species (e.g., species, subspecies, genus) and examples of indigenous taxa listed as Threatened or At Risk within the Waikato Region include Maui’s Dolphin, Bryde’s Whale and Archey’s Frog (nationally critical), Mokoau Stag beetle and Kokako (Nationally endangered), NZ Falcon and Long-tailed bat (nationally vulnerable), and North Island Brown Kiwi (Serious decline)

67 Including, for example, the West Coast North Island Marine Mammal Sanctuary
The Explanation to Policy 11.4 records:

It is intended that areas of significant indigenous biodiversity within the coastal environment are identified within those addressed by Policy 11.2 and Method 11.4.1 and 11.4.2 identify that link as well as recognising the benefit of protecting representative marine habitats and ecosystems in a marine are network.

[87] The Council’s approach in the proposed RPS is therefore that the actual identification of areas of significant ecological value is a matter to be undertaken in the future through regional and district plans.

Do the above proposed RPS provisions meet the requirements of the NZCPS in relation to the site?

[88] Mr Milne submitted that the provision of criteria and the related implementation methods was sufficient to meet the requirements of the NZCPS. To support his argument he referred to Sustain Our Sounds Inc v NZ King Salmon Company Ltd, the Department of Conservation Guidance Notes on the NZCPS, and an analysis of how and where the word identify is used in the NZCPS. He also argued that the specific identification of areas in Policy 7 could only be done in regional plans, as Policy 7 refers to protection being achieved through objectives, policies and rules, the latter being only able to occur in plans as opposed to regional policy statements. We will deal with each argument in turn.

Sustain Our Sounds argument

[89] Mr Milne referred specifically to paragraphs [31] to [33] of this decision, which appear under the heading The Marlborough Regional Policy Statement. Specifically, Mr Milne referred to paragraph [32] which provides:

[32] Resource Management Plans are required to identify criteria to indicate where subdivision use and development will be appropriate. Criteria to indicate where subdivision, use and development is inappropriate may include issues relating to water quality... [emphasis added]

[90] Mr Milne then highlighted paragraph [33] which addresses the Sounds Plan as follows:

The introduction to the plan, in chapter 1, explains that a comprehensive range of assessment criteria are included in the second volume. These

---

[68] [2014] NZSC 40 at paragraphs [31]-[33]
criteria are included to enable an applicant for a resource consent to understand how any particular activity will be assessed.

[91] Mr Milne submitted that:69

it is unthinkable that the Supreme Court would not have said that the Regional Policy Statement did not give effect to the NZ Coastal Policy Statement by requiring resource management plans to identify criteria to indicate where subdivision, use and development would be appropriate, if it had not considered that identification of such areas was required in the Regional Policy Statement itself. The Supreme Court made no such comment.

[92] Furthermore, Mr Milne highlighted that it was the plans in that case which were to define the criteria, not the policy statement, which he submitted was one step further removed from the present case, given that the proposed RPS includes the detailed criteria in relation to outstanding natural features and landscapes (12A, Table 12-1) and landscape values and characteristics assessment criteria (12B, Table 12-2).

[93] We do not agree that the Sustain our Sounds case gives any weight to Mr Milne’s submission. A close examination of that case reveals that the main issues on appeal were to do with adaptive management as opposed to the spatial definition of the outstanding natural landscape into which the activity was proposed to be placed. We are not convinced that the arguments presented to the Supreme Court were specifically addressed to the interpretation of Policy 7, which we are now being asked to interpret.

[94] Furthermore, we are not able to determine from the Sustain our Sounds decision, at paragraph [32], what it was that enabled the Supreme Court to determine that resource management plans are required to identify criteria to indicate where subdivision, use and development will be appropriate. Section 67 of the Act outlines the contents of regional plans, which include that a regional plan may state the methods, other than rules, for implementing the policies for the region (s67(2)(b)) which could include outlining criteria. Certainly we can find no support in the Act or the NZCPS to require criteria to be used as a preferred method for achieving the policy intent of a plan.

69 Mr Milne, Closing submissions, paragraph [47]
Department of Conservation Guidance Notes

[95] Mr Milne then referred to the Department of Conservation Guidance Notes on the NZCPS. He referred specifically to the notes concerning Policy 7. At paragraph [51] of his submissions, Mr Milne quoted from the Guidance Note at page 11 as follows:

Policy 7 does not explicitly require councils to identify such areas in policy statements and plans. The direction is to provide protection for them from inappropriate subdivision, use and development. Identification can be useful to identify the important places and values and for this reason a number of other NZCPS 2010 policies do promote this approach.

Where areas are to be identified, the task can be addressed in a variety of ways. A judgement call is required as to which approach to use to achieve the protection from inappropriate uses. This decision will require a judgement call that considers matters such as the significance of the values, the threat to them, and other methods available to be used in combination (eg incentives) or as alternatives.

Commonly used approaches include scheduling specific high-value areas, the identification of character areas, through to more general criteria-based provisions.

[96] Mr Milne then highlighted Table 1 which follows\(^70\) entitled Examples of the Resource Management Act 1991 (RMA) approaches to the identification of areas, which lists three examples:

1. Schedule specific areas; places are identified in an Appendix to a regional policy statement and/or plan.
2. Characterise management areas; management areas are identified in regional policy statements and/or plans as requiring particular considerations and decision-making.
3. General rules triggered by criteria.

Mr Milne submitted that the third example is the approach taken by the respondent.

[97] The first question is what status should be given to the Department of Conservation's Guidance Notes. It is clear that they have no statutory basis, and that whilst helpful, they are not legally binding on the Court as necessarily properly interpreting the provisions of either the Act or the NZCPS. Whilst the Supreme Court may have referred to the Guidance Notes, not surprisingly it did not determine that the Guidance Notes are determinative, and indeed the Guidance Notes themselves include a disclaimer that they are not a substitute for legal advice, neither are they official government policy.

\(^70\) Mr Milne, Closing submissions, paragraph [52]
We do not agree with the Guidance Note when it states that Policy 7 of the NZCPS does not explicitly require Councils to identify areas of the coastal environment where particular activities and forms of subdivision, use and development are or may be inappropriate. The wording of Policy 7(1)(b) is clear that this is exactly what is required. We agree that the way in which the area is identified is not specified, and we accept that the process of identification will lead to a conclusion about whether an area should be identified, but the two are not the same. In our view, areas where particular activities and forms of subdivision, use and development are or may be inappropriate are required to be identified to accord with Policy 7. It follows that, whilst there are a number of ways in which such areas can be identified, this does not mean that a choice can be made not to identify them. The reason for this, in our view, is obvious given the purpose of the Act, and the requirement in s6(c) that all persons exercising functions and power under the Act in relation to managing the use, development and protection of natural physical resources are required to recognise and provide for the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna as a matter of national importance.

In our view the provision of criteria in the proposed RPS does no more than to require the assessment of an area to be identified as significant or otherwise at a later date. In this case the assessment of the site has been undertaken and the conclusion is that the ecological values there are nationally and therefore regionally significant. The site has therefore been assessed as suitable for identification at a regional level and it follows that the site is required to be identified at a regional level. The question is whether this can be left to the Regional Plan or whether it needs to be identified in the proposed RPS.

Does Policy 7(1) (b) apply to Regional Plans only?

Mr Milne highlighted that the protection of identified areas in Policy 7(1)(b) is to be provided through objectives, polices and rules. He submitted that Policy 7(1)(b) cannot apply to regional policy statements because regional policy statements cannot provide protection through rules because of section 62(1)(e) of the Act, By way of comparison a regional plan may include rules in accordance with section 68 of the Act, and a district plan must include rules pursuant to section 75(1)(e).

Mr Lloyd’s argument was that the inclusion of the comma in the introduction to Policy 7 after the words regional policy statements and before the
words *and plans* means that the identification required by the policies must occur in both documents. Mr Milne submitted that if this were correct then it would simply not be legally possible to give effect to that direction.

[102] We are not persuaded by either argument. Sub-paragraphs (a) and (b) are both part of Policy 7(1), which in our view means that both equally apply to regional policy statements and plans, rather than to regional policy statements *or* plans. However, we do not read this as requiring both documents to duplicate the provisions of the other. Neither does it mean that it is not legally possible to include provisions in the RPS that give strong direction. Clearly, a regional policy statement cannot include rules (although as the Supreme Court has identified some policies can come relatively close to being like rules if they are prescriptive). In the end it may come down to a matter of timing in terms of the document that can give effect to the NZCPS and, as in this case, better protection to a known area of ecological significance.

[103] In our view, identifying areas is very different from providing criteria for the assessment of them. The assessment criteria provided in Table 11-1 of the proposed RPS deal with the quality of the area proposed to be identified, and the evaluation of them is necessary in order to reach a conclusion about whether or not an area should be identified as one of ecological significance. This in our view is consistent with Policy 11 of the NZCPS, but if, after such an evaluation a conclusion is reached that the area is a representative or significant natural ecosystem and site of biological importance, then it must be *protected* in order to meet Objective 1. Then what is required is for the area to be protected from inappropriate subdivision, use and development, and to do this, such areas need to be *identified* in accordance with Policy 7.

**Conclusion**

[104] We conclude that in this case, the site has been assessed by the ecologists as one of national and therefore regional ecological significance, with the result that further assessment under Table 11-1 of the proposed RPS is not necessary. For the reasons we have expressed, we find that the proposed RPS is required to identify the site in order to give effect to Objective 1 and Policies 7 and 11 of the NZCPS and has not done so.
If the site was identified (by mapping or otherwise) in the proposed RPS would this result in an unusual planning outcome and if so, does this matter?

[105] We asked the Council about the possibility of specifically identifying the site in the proposed RPS as an ecologically significant site. We suggested that the proposed RPS could explain that its worth had been subject to rigorous testing through an Environment Court process.\(^71\)

[106] Mr van Voorthuysen agreed that this would be possible, but he considered that it would create a precedent insofar as it would be the only map of a s6(c) area in the proposed RPS. He described this as a *really odd planning outcome*, particularly given that the Coastal Plan addresses the Opoutere area *in terms of its ASCV*, and he imagined District Plans in the region were undertaking mapping exercises in relation to s6(c) areas in any event. He referred to being aware that the South Waikato District Plan was undertaking that task. He said that, were Opoutere to be mapped in this way, he would ask himself *why is this being done?* And he would instantly, if he came afresh to it, think *well, this must be the most special and unique area in the region as the sole map of significant natural area in the proposed RPS*.\(^72\)

[107] We do not agree that Mr van Voorthuysen’s opinion is the inevitable response, particularly if the reason is clearly articulated in the proposed RPS. The reason is clear – ORRA has mounted a successful case in the Environment Court for the inclusion of the site as an ecologically significant area.

[108] Mr van Voorthuysen did not know what the Council’s work programme in terms of indigenous biodiversity was, but he did know from speaking to the Council staff that they are only part-way through the process captured in the flowchart in the proposed RPS, and that progress varied from place to place within the region.\(^73\) From talking to the staff, he gained the impression that it was a task that would be left for another day because of the numbers of areas involved, and because the mapping, ground-truthing and talking to land owners takes a lot of time.\(^74\) Mr Milne submitted that there are too many sites in the region, and it would be an impossible task to map them all in the proposed RPS, however the NZCPS only covers those in the coastal environment and the Council is doing the mapping anyway.

---

\(^{71}\) Transcript, page 141, lines 10 - 14

\(^{72}\) Transcript, page 141, lines 1-23

\(^{73}\) Ibid, page 142, lines 1 – 8

\(^{74}\) Ibid, page 142, lines 21 – 31
Mr van Voorthuysen also addressed this issue via his s32 analysis. He said it would not be efficient or effective to specifically identify the site as of ecological significance in the proposed RPS as that is not the planning approach adopted by the Council. He said that the policy and the criteria in the proposed RPS would allow areas of significant indigenous vegetation and significant habitat of indigenous fauna to be identified in the future and thereafter included in regional and district plans. He considered that to be a sensible way to achieve Objective 3.18 of the proposed RPS and that it was a similar approach to that adopted by other RPS’s with which he is familiar. We received no evidence about the approach taken to this issue in other regional policy statements, but in any case we find it to be beside the point. The fact that a particular planning approach to a specific issue is taken elsewhere, does not mean that it is the correct approach either in the generality or for the specific fact situation that we have before us.

It is four years since the NZCPS 2010 came into force and we understand that the Council has yet to review its proposed RPS to give effect to the NZCPS, although we were not provided with any evidence about the proposed timeframe over which this is projected to occur. Similarly, we were not provided with any evidence about when the Council itself and the District Councils within its region are likely to implement the requirements of the proposed RPS about areas of significant indigenous vegetation and habitats of indigenous fauna. As against that, the ecological significance of the site, including the assessment of it against the criteria in the proposed RPS, has been thoroughly tested during this hearing; indeed Mr Kessels, the Council’s witness on the topic, substantiated its ecological significance.

We do not accept that it would be an odd planning outcome or that it would not be efficient or effective to specifically identify Opoutere as an area of ecological significance in the proposed RPS. To the contrary, we find that to do so would achieve the objectives and policies of the proposed RPS directed at protecting indigenous biodiversity values in the coastal environment, and would go some way towards achieving the objectives and policies of the NZCPS and the relevant objectives of the Hauraki Gulf Marine Park Act 2000.

---

25Mr van Voorthuysen, evidence-in-chief, page 16, paragraph [7.3]
Are the provisions of the Coastal Plan sufficient to protect the site and if so, does this mean it does not need to be more specifically identified in the proposed RPS?

[112] Mr Milne submitted that the Coastal Plan, in any event, provides sufficient protection for the site which means that it does not need to be more specifically identified in the proposed RPS. We do not agree with this submission because:

(a) The Coastal Plan was promulgated in 2004, well before the NZCPS 2010, and there is nothing to suggest that the NZCPS 2010 provisions, apart from those relating to restricted coastal activities, have been changed as a result of the NZCPS 2010; and

(b) The area covered by the Coastal Plan is not the same as the area sought to be identified by ORRA. That area extends well beyond the coastal marine area in places.

NCZPS 2010 preceded the Coastal Plan

[113] The Coastal Plan was adopted by the Council in July 2004 and has been updated at various times since, one of which was to respond to Policy 29 in the NZCPS 2010 to remove all references to restricted coastal activities, making them discretionary activities.\(^\text{76}\)

[114] As we have already outlined, Opoutere is identified as an ASCV (ASCV24) in the Coastal Plan. Mr van Voorthuysen’s opinion was that the ASCV already affords what he described as strong, but not absolute protection of the area identified.\(^\text{77}\) He said that the Coastal Plan imposes a very high threshold in terms of doing anything within an ASCV, and it would be very difficult for there to be development within it or adjacent to it.\(^\text{78}\)

[115] A question for the Court is whether that degree of protection provided by the ASCV accords with the degree of protection afforded by the NZCPS 2010.

---

\(^\text{76}\) Effective as of 24 February 2011
\(^\text{77}\) Transcript, page 148
\(^\text{78}\) Ibid, page 147, lines 10–35
Mr van Voorthuysen referred to the following:

Policy 3.2.1 – Protection of Significant Vegetation and Habitat
(b) Identify areas of significant indigenous vegetation and significant
habits of indigenous fauna and protect by:
(i) avoiding any adverse effects of subdivision, use and development
on the areas listed in Policy 1.1.2(a) of the NZCPs;
(ii) avoiding or remediating any adverse effects of subdivision, use and
development on the areas listed in Policy 1.1.2(b) of the NZCPs.

(Our emphasis)

These policy measures do not give effect to (or equate to) those provided to
protect indigenous biodiversity in the coastal environment in the NZCPs 2010. The
significant indigenous vegetation and significant habitats for which avoiding any
adverse effects of subdivision, use and development is required in Policy 1.1.2(a) of
the NZCPs 1994 are not the same as those in Policy 11(1)(a) of the NZCPs 2010.
On top of that, some of the areas in Policy 1.1.2(b) of the NZCPs 1994 carried
through into the NZCPs 2010 require significant adverse effects on them to be
avoided and not remedied as an alternative. As well, the lists of types of indigenous
biodiversity (both flora and fauna) in Policy 11(1) and (2) of the NZCPs 2010 are
more comprehensive than those that appear in Policy 1.1.2 of the NZCPs 1994.

On top of that for conservation values other than significant indigenous
vegetation and significant habitats of significant indigenous fauna identified under
Policy 3.2.1a, the protection is much weaker than that which is required under Policy
11 of the NZCPs 2010. Policy 11 does not qualify the requirement to avoid, remedy or
mitigate as far as practicable or to the extent practicable, which is the wording
included in Policy 3.2.1a. The explanation to the Policy is also not encouraging. It
states:

This policy does not preclude appropriate use of development within the
ASCV, rather it requires that the conservation values identified within
these areas should be carefully managed.

79 Exhibit 5
Perhaps none of this is surprising given the timing of the NZCPS 2010 relative to the notification of the proposed RPS.

Coastal Plan identifies different area than that sought by ORRA

ASCV 24 is described as Opoutere Sandspit and Wharekawa Harbour and Map 24 depicts it. As ASCV 24 is in the Coastal Plan it only covers the coastal marine area and it does not cover the ocean beach, or that part of the spit and other areas that are above the line of mean high water springs. The conservation values of the ASCV are identified as follows:

- Site of significance to Hauraki iwi
- Large breeding population of NZ dotterel
- Resident and frequenting rare and threatened waders and coastal bird species, including variable oystercatcher, banded rail and bittern
- Significant saltmarsh, eel grass and mangrove communities
- Gathering of shellfish
- Wildlife Refuge, gazetted 1987

The boundary of ASCV24 is not the same as that sought in the ORRA appeal which extends along and inland from Opoutere Beach beyond the Coastal Marine Area, as well as on to other land outside the Coastal Marine Area, particularly to the north-east and the south-east from the eastern end of the Opoutere settlement. Nor is it the same as the areas identified by Mr Kessels as having significant ecological values in Exhibit 3. ASCV24 is much more limited in area which is not surprising given that the Coastal Plan deals with the Coastal Marine Area and not land outside it.

The Coastal Plan therefore does not cover the entire area that the proposed RPS could and afford the necessary degree of protection. That would need to await protection through provisions in a District Plan and we had no evidence on whether such provisions existed, or their adequacy in terms of the requirements of the NZCPS.

---

80 The boundary of the ASCV 24 (shown in blue) is slightly short of the inland boundary for the Coastal Marine Area and extends from Ruahihi Point in the south, north to intersect with the beach just beyond the spit. Wharekawa Harbour has bird roosting shown, with the spit having a symbol for bird roosting and bird nesting and there are also symbols for feeding (waders) shown in the Harbour areas of marshlands and mangroves in the southern part of the harbour with the latter appearing to extend outside the ASCV. Wharekawa Sandspit Wildlife Refuge is also marked but it is unclear how much (if any) of it is within the ASCV. Opoutere Beach and the spit are shown with a hatched area in yellow for sand dunes, but only the spit is within the ASCV.

81 Transcript, page 136, lines 15 - 25
Conclusion

[123] As outlined above, we do not agree that the provisions of the Coastal Plan will provide the degree of protection that identifying the site in the proposed RPS will provide. The best protection available would be for it to be specifically identified in the proposed RPS because the more subordinate planning instruments are then required to give effect to its provisions. The specific identification of the site in the proposed RPS would also mean that decision-making on resource consent applications and designations (and potential applicants and submitters) would be clear on the ecological values of the area and the policy to be applied to protect those ecological values.

[124] As well, we were provided with no evidence about the timeframe for the review of the Coastal Plan, or indeed the timetable for the review of the Regional Plan. This means that for a period of time there would be a potential interregnum where the entire area of ecological significance might be potentially at a greater risk than it need be, if not from subdivision or development, then from use. On the evidence we have had before us, particularly the avian values present at this nationally ecologically significant site require the highest level of protection that is able to be given to it as soon as possible and in a way that holistically manages all of the area the ecologists have identified as being significant.

Overall conclusion

[125] We conclude for the reasons expressed above that the mapped area identified by Mr Kessels in Exhibit 3 should be included in the proposed RPS as this is necessary to protect the ecological values that are present there. We find that Table 11-1 and the relevant implementation methods outlined in the proposed RPS and ASCV24 in the Coastal Plan do not of themselves protect this area, which is required by the NZCPS, s 8(a) of the Hauraki Gulf Marine Park Act and the RMA. Furthermore they are not the most appropriate way to achieve the objectives. Whilst this decision means that at this time the area will be the only one listed in the proposed RPS, we do not see this as a reason to not do it.

Should Opoutere be identified as an ONFL?

[126] This part of the argument for ORRA focussed more on the respective assessments undertaken by each of the landscape experts, who were Mr Stephen
Brown for the Council and Mr Mark Lockhart for ORRA. The issue for determination is whether the area defined by Mr Lockhart, (delineated with a dark blue line in Annexure 1 to his evidence), qualifies as an ONFL and should be mapped and included in Table 12-2 of the proposed RPS.82 Despite this being the main focus of the argument, Mr Lloyd during the course of his submissions raised an issue about the interpretation of Policy 15 of the NZCPS. Because the proposed RPS is required to give effect to the provisions of the NZCPS we start by outlining the relevant provisions of the NZCPS and reiterating the point that the proposed RPS was notified before the NZCPS came into force.

The NZCPS

[127] Objective 2 and Policy 15 are particularly relevant to this part of our decision. Mr Lloyd also referred to Policies 1 and 7, which have general application. We have already outlined our findings in relation to them.

[128] Objective 2 of the NZCPS provides:

To preserve the natural character of the coastal environment and protect natural features and landscape values through:

- recognising the characteristics and qualities that contribute to natural character, natural features and landscape values and their location and distribution;
- identifying those areas where various forms of subdivision, use, and development would be inappropriate and protecting them from such activities; and
- encouraging restoration of the coastal environment

[129] Objective 2 deals with the preservation of the natural character of the coastal environment (s6(a) of the Act), and the protection of natural features and landscape values. Policy 13(2) clarifies that both concepts are not the same. We have already determined that as ORRA’s original submission and notice of appeal did not raise natural character as an issue, so that it is precluded from raising it now, but in any event it makes no real difference to the outcome of this case as the evidence focussed on the landscape values of Opoutere. Accordingly we concentrate on the part of Objective 2 that deals with the protection of natural features and landscape values.

82 Mr Lockhart’s area covered Ohui/Opoutere Beach from the Ohui Bluffs in the north, including Motohau Rock, to the ridgeline of Ruhiwhiwi Point (a former Maori pa site) on the southern side of the estuary mouth, including Hikinui Island, and inland including the Department of Conservation reserve that runs the length of the beach and the Wharekawa estuary and Maungarauwahine. He visually identified the above area on a map that appears as Annexure 1 to his evidence-in-chief.
Policy 15 deals specifically with natural features and natural landscapes. It provides:

Policy 15 Natural features and natural landscapes

To protect the natural features and natural landscapes (including seascapes) of the coastal environment from inappropriate subdivision, use, and development:

(a) avoid adverse effects of activities on outstanding natural features and outstanding natural landscapes in the coastal environment; and

(b) avoid significant adverse effects and avoid, remedy, or mitigate other adverse effects of activities on other natural features and natural landscapes in the coastal environment; including by:

(c) identifying and assessing the natural features and natural landscapes of the coastal environment of the region or district, at minimum by land typing, soil characterisation and landscape characterisation and having regard to:

(i) natural science factors, including geological, topographical, ecological and dynamic components;

(ii) the presence of water including in seas, lakes, rivers and streams;

(iii) legibility or expressiveness—how obviously the feature or landscape demonstrates its formative processes;

(iv) aesthetic values including memorability and naturalness;

(v) vegetation (native and exotic);

(vi) transient values, including presence of wildlife or other values at certain times of the day or year;

(vii) whether the values are shared and recognised;

(viii) cultural and spiritual values for tangata whenua, identified by working, as far as practicable, in accordance with tikanga Māori; including their expression as cultural landscapes and features;

(ix) historical and heritage associations; and

(x) wild or scenic values;

(d) ensuring that regional policy statements, and plans, maps or otherwise identify areas where the protection of natural features and natural landscapes requires objectives, policies and rules; and

(e) including the objectives, policies and rules required by (d) in plans.

Mr Lloyd submitted that Policy 15(d) requires the proposed RPS to identify areas where the protection of natural features and natural landscapes require objectives and policies, and he highlighted that the omission of the adjective outstanding was significant and must have been by design. The conclusion he asked us to draw from its omission was that the drafters of the NZCPS did not want the natural features and natural landscapes identified and protected in regional policy statements to be limited to only those that are outstanding. In other words, they were requiring the bar to be set lower for landscapes and features in the coastal area.
[132] In *Environmental Defence Society v King Salmon* the Supreme Court considered various policies in the NZCPS, albeit in the context of the facts before it, which clearly established (and about which there was no dispute) that the landscape in issue was outstanding. The Supreme Court noted that the NZCPS was a carefully expressed document, whose contents had been the result of a rigorous process of formulation and evaluation. It was also noted that the NZCPS 2010 provided clearer direction on protecting and managing New Zealand’s coastal environment than its predecessor.

[133] As well, the Supreme Court said the following:

[129] When dealing with a plan change application, the decision-maker must first identify those policies (meaning of the NZCPS) that are relevant, paying careful attention to the way in which they are expressed. Those expressed in more directive terms will carry greater weight than those expressed in less directive terms. Moreover, it may be that a policy is stated in such directive terms that the decision-maker has no option but to implement it...

[132] Policies 13(1)(a) and (b) and 15(a) and (b) do, in our view, provide something in the nature of a bottom line... The RMA contemplates that District Plans may prohibit particular activities, either absolutely or in particular localities. If that is so, there is no obvious reason why a planning document which is higher in the hierarchy of planning documents should not contain policies which contemplate the prohibition of particular activities in certain localities.

(Emphasis added)

[134] Mr Lloyd’s submission on this point was slightly confusing, given that ORRA’s evidence was presented with the intention of persuading the Court that Opoutere is outstanding, and therefore should be listed as an ONFL. The effect of Mr Lloyd’s submission on Policy 15(d) and his reference to the *EDS v King Salmon* decision appears to be that the requirement to identify natural features and landscapes in the coastal environment is not limited to those that are outstanding. However, the case he ran and the evidence of Mr Lockhart, ORRA’s landscape witness, was directed at whether Opoutere is an ONFL that is required to be identified and protected under Policy 15(b). Mr Milne did not cover this point in any detail in his reply submissions filed after the hearing, rather he contended that the issue for the Court to determine was essentially factual; that is an evaluation of the conflicting experts opinions, informed by the Court’s site visit. As Mr Lloyd’s submission does

---

83 *Environmental Defence Soc Inc v the New Zealand King Salmon Co Ltd* [2014] NZSC 38, at paragraph [80]
84 Ibid, paragraph [90]
85 Ibid, paragraph [134]
86 Ibid, paragraphs [129]-[132]
not accord with the evidence called in support of his case, we take the point no further.

**The arguments and the issues**

[135] The appellant submitted that the large volume of evidence on this issue could be boiled down to two quite simple competing positions:

(a) Mr Brown says that Opoutere is too modified by surrounding production forestry and farmland to qualify as an ONFL.

(b) Mr Lockhart disagrees. He says that Mr Brown (and other landscape assessments) place too much emphasis on the surrounding production forestry and farming and insufficient emphasis on other aspects of Opoutere, particularly the ecological, but also socio-cultural and heritage factors.\(^{87}\)

[136] Another issue arose during the hearing largely as a result of the Court’s questioning. This concerned whether or not there was a distinction between outstanding natural features (ONFs) and outstanding natural landscapes (ONLs) given that the proposed RPS deals with both together as ONFLs.

[137] From the above and from our previous analysis of Mr Lloyd’s arguments, we distil the following issues that need to be determined:

(a) Is there a distinction between ONFs, ONLs and ONFLs that is important, and if there is, has this affected the assessments undertaken by the experts?

(b) What parts of the landscape should be assessed?

(c) Does all or part of Opoutere qualify under the assessment criteria as an ONFL?

**ONF, ONL or ONFL?**

[138] Section 6(b) of the Act refers to the protection of *outstanding natural features and landscapes*, but Policy 15 of the NZCPS refers to *outstanding natural features* and *outstanding natural landscape*. However as we have outlined above, the

---

\(^{87}\) Mr Lockhart, evidence-in-chief, paragraph [23]
timing of the notification of the proposed RPS meant that this preceded the NZCPS coming into force.

[139] The Court was keen to understand the reasoning of the Council in not distinguishing between ONF's and ONL's in the proposed RPS, and in particular to understand whether parts of Opoutere could be treated as ONF and parts as ONL; for example whether the Wharekawa Harbour could be treated as an ONF and the beach, sandspit and headland as an ONL.

[140] Mr van Voorthyusen's answers indicated that at least from a planning perspective the distinction had not been given much thought and he observed that a lot of Councils have just lumped them into one, but the Court's experience is that there are a developing number of planning instruments that do make the distinction. Mr van Voorthyusen was fair in his concession that it might be better to treat features and landscapes separately.88 Mr Brown was alive to the distinction and helpful in his explanation of the differences.89 He highlighted that for an ONL, wider concepts such as perception of the landscape and how values are attached to it comprise part of the assessment, and therefore a much broader interpretation of what comprises the landscape is required. By way of comparison, his evidence was that the assessment of an ONF is more specifically focused on the nature of the feature itself, which may be of scientific, heritage and/or educational importance.90

[141] The following exchange between Mr Brown and the Court is now set out:91

Q So just picking up on the concept about outstanding natural features as opposed to outstanding natural landscapes, are you saying that you can have both the separate things?
A Yes.
Q And sometimes the two might be combined?
A Sometimes they might, but I think they would probably be defined for different - they would have a different basis. The landscapes would be, would be appreciated in a different way from features. The features really should have scientific, educational value, natural heritage value, inherent natural heritage value regardless of what they look like. Whereas there's no doubt that the identification about outstanding natural landscapes does have a lot to do with what these landscapes look like.
Q So again, just picking up to be absolutely clear - if we were to separate out the harbour for argument's sake as an ONF for

---

88 Transcript, page 143, line 29 to page 144, lines 1-5
89 Mr Brown, evidence-in-chief, Annexure 4
90 Transcript, pages 95-97
91 Transcript, page 98, lines 10-31

ORRA (Decision) Combined
ecological reasons were there evidence to support that, would you then consider the beach – I think I heard you say “no” – the beach as an ... ONL.

A No I think the beach is closer to becoming an ONL. I am just not convinced that it quite reaches the level that has been set for all of the ONLs to date within the region. But in isolation, as my page 24 suggests, it certainly gets close. But the harbour area is not close in terms of land – from a landscape perspective.

[142] Mr Lloyd, when questioned, was reasonably dismissive about the distinction between ONFs and ONLs, maintaining that the cases had treated them in the same way. He described the distinction as a red herring but was not opposed to the idea, should the Court consider that a distinction existed.92 We consider there to be a distinction, and developing case law has certainly recognised there is a difference, but we are left in the position that the point was not strongly argued for by ORRA, and as we foreshadow, the Council has not separately categorised outstanding natural features.

[143] The concern is that if the option chosen is to categorise ONF’s and ONLs together as ONFLs, then given Mr Brown’s response, the assessment of a proposed ONFL and arguably the assessment criteria themselves will need to be more finely tuned to ensure that the correct basis for assessment is applied, depending on whether a landscape or a feature is being assessed, or whether a feature within a landscape is being assessed. With this in mind, we turn to consider how the proposed RPS deals with features and landscapes.

[144] Section 12B of the proposed RPS outlines the landscape assessment approach. It purports to define landscape and feature as follows:

Landscape is a cumulative expression of natural and cultural features, patterns and processes in a geographical area, including human perceptions and associations (New Zealand Institute of Landscape Architects Best Practice Note 10.1, November 2010). A feature is a discrete part of a landscape.

The next mention of feature appears under the heading Assessing Landscapes at stage four of the assessment process, where there is a requirement to Explain the appraisal of each landscape (or feature) with reasons.

[145] The proposed RPS on our view, whilst referring to features and landscapes does not in fact distinguish between the two either in terms of the assessment criteria

92 Ibid, pages 14-15
that apply, or the approach taken to assessment. The inference we draw is that the proposed RPS envisages that ONFL’s are in fact assessed as landscapes and that any features within them are brought under the landscape assessment umbrella.

[146] We are left in somewhat of a dilemma as a result of the above because of the way the case was argued for ORRA, and the fact that Mr Lockhart’s evidence like Mr Brown’s, focused on assessing the whole of the landscape including the obvious natural features within it such as Mototuna Rock, Wharekawa Harbour, the beach and the spit (the latter two arguably could comprise a landscape and a feature.) As well, the wider landscape lens is used for the experts assessments, rather than the more specific lens used as Mr Brown suggested, when dealing with ONFs. We conclude therefore that the assessments undertaken by the experts were basically landscape assessments, but we record our considerable unease that this approach may have produced a result that is not sufficiently refined for the Opoutere environment. We say this because this is an environment which seems to us to include elements of ONF and ONL, and whilst it is described as combining both (because it is called an ONFL), it is apparent to us that it has fact only been assessed through an ONL lens. The question for us is whether the analysis undertaken by the experts can nonetheless provide an evidential foundation for us to reach a conclusion on this point, but we have decided, because of the way the case was run, that it cannot.

What parts of the landscape should be assessed?

[147] The landscape experts agreed\(^3\) that the Opoutere landscape includes both the harbour and the ocean beach, and the aspects of both that they identified were the same as those listed above in paragraph [39]. Mr Lockhart referred to the difficulty of defining appropriate boundaries for any given landscape. He said:\(^4\)

> However in this case the Ohui bluffs and ridge line of Ruahitihiwi Point provide very suitable and easy to define northern and southern points of the Opoutere beach. The estuary itself is easily identified as is the escarpment containing Maungaruawahine on the estuary’s northern border.

[148] Mr Lockhart’s delineated line for the ONFL proposed by ORRA does not include however any production forestry or housing\(^5\) and only a little of the

\(^3\) Joint Witness Statement-Landscape
\(^4\) Mr Lockhart, evidence-in-chief, paragraph [35], page 179
\(^5\) Mr Lockhart, evidence-in-chief paragraph [71]
surrounding farmland, with the result that Mr Brown questioned whether Mr Lockhart had properly assessed the landscape in issue.

[149] Mr Brown was critical of Mr Lockhart’s boundary, describing it as:

...a completely arbitrary construct that bears no relation to the landscape of Opoutere and Wharekawa.96

He said Mr Lockhart had completely excluded a large part of the visual and physical catchment, around the harbour in particular. He referred to:

...the settlement, the areas of production forestry south and east of the harbour, the production forestry west of the harbour, the farming at the head of the harbour, the settlement next to it, the transmission lines97 going across the harbour, all those are part of what I have looked at and that I regard as being part and parcel of this landscape. ... It is not just all the nice bits.

[150] There was however in fact very little difference between the experts about the boundary of what Mr Brown identified on his Annexure 16 as the Opoutere Beach Catchment. Mr Lockhart’s boundary for assessment included the area to the south of the camping ground and Mr Brown’s did not, but apart from that, the boundary adopted by Mr Lockhart was similar to that adopted by Mr Brown.

[151] The major difference between the experts was in relation to what Mr Brown described, and showed (in part) as the Wharekawa Harbour Catchment on his Annexure 16. On the western side of the harbour Mr Lockhart’s delineated line did not include the settlement that extends south to Kapakapa Stream and the native forest/bush behind it. On the eastern side both witnesses adopted boundaries that took in farm land close to the eastern entrance to the harbour. Mr Lockhart described this as the ridge line of Ruahiwihw Point, although Mr Brown’s boundary appears to take in a little more farm land. However, further south on the eastern side Mr Lockhart’s delineated line closely hugged the shoreline and the road and did not extend up to the ridgeline to take in an extensive area of production forestry and associated roading. Mr Brown emphasised that this resulted in a key difference in perspective from the main point of entry to Opoutere.

[152] In support of his boundary, Mr Brown attached to his evidence an independent landscape assessment commissioned by the Council from Beca Ltd dated

96 Transcript, pages 66 – 73.
97 He meant ‘power lines’ given elsewhere in his evidence he refers to and the photographs show power lines.
9 September 2013 (a peer review), which concluded that Opoutere does not qualify as an ONFL because it is too modified. It assessed a much larger landscape than that proposed by Mr Lockhart or even Mr Brown and is therefore in our view not comparable. But in any event, this is not in our view a major point. More important are the reasons given by Mr Lockhart for his delineated line and his explanation of how it related to the area he assessed, and Mr Brown’s reasons for his critique of this.

[153] Mr Milne submitted, that Mr Lockhart’s proposed ONFL artificially divides the landscape as it is outlined in the joint witness statement, requiring the viewer to turn a deliberate blind eye to areas that are very much physically present but which even Mr Lockhart agreed do not qualify as part of the ONFL. This, he submitted was illustrated, when a series of photographs attached to Mr Brown’s evidence-in-chief on which he had delineated a blue line with a cross above the areas that were visible from the identified viewpoints, were put to Mr Lockhart in cross-examination. These viewpoints had been excluded from Mr Lockhart’s proposed ONFL, but he agreed in cross-examination that the photographs accurately depicted what was seen from them.

[154] Mr Lockhart’s point however, was that he had included these areas in his assessment of the criteria, but did not include them in his proposed delineated ONFL. He accepted that the areas above the delineated line would not meet the ONFL criteria, but we infer from the context of this concession, that he was agreeing that the areas above the line would not, if assessed without reference to the rest of Opoutere’s landscape values meet the test. In our view this concession is consistent with what we understand Mr Lockhart’s opinion to be, which is that even if one takes into account the fact that the areas above the line do not meet the ONFL criteria, the sum of the other values of the Opoutere landscape outweigh this aspect.

[155] Had Mr Lockhart failed to take these areas into account in his assessment, this would have affected the basis for his opinion, but as we have outlined above, we accept that Mr Lockhart did include them in his assessment, despite the fact that they are excluded from his delineated line. The question for us is whether we agree with Mr Lockhart’s assessment that the sum of the other landscapes values present at Opoutere are such, that despite the viewpoints above the line, the area he has delineated is properly an ONFL.
It follows that the differences between the witnesses about the extent of the landscape, are not so much about what was assessed, but whether or not it is artificial for Mr Lockhart’s line not to include them. Given that the areas above the line were included in Mr Lockhart’s assessment we have formed the view that the distinction is not material, as the issue is more about what weight should be given to the landscape values of the areas above the line in the overall assessment.

We also make the point that for every landscape identified as an ONFL there will be a line delineating it from neighbouring areas that are not considered to be outstanding. In other words, the delineation itself identifies the distinction between ONFLs that are outstanding and those that are not.

For the reasons we have expressed above, we do not agree that Mr Lockhart’s boundary was “a completely arbitrary construct” as Mr Brown suggested.

Does all or part of Opoutere qualify under the assessment criteria as an ONFL?

As we have outlined above, Mr Brown accepted that Opoutere Beach was closer to being categorised as an ONFL than Wharekawa Harbour, but he did not consider it to necessarily be outstanding on a regional basis. Moreover Mr Brown said that the ocean beach is not sufficiently distinct or special to be an ONFL when compared with other parts of the regional coastline including the likes of New Chums Beach and Waikawau Bay. His opinion was that Wharekawa Harbour did not qualify as an ONFL, because it was not outstanding, given the presence of farming, forestry and settlement within the landscape. Mr Lockhart did not agree. He argued that Opoutere was the sum total of its parts and that all the area he identified in his Annexure 1 was outstanding. He did not specifically address whether it might qualify as an ONF because of its significant ecological and scientific values.

We note that a recent High Court decision might now throw into doubt whether or not an outstanding natural feature or landscape must also meet a threshold of significance at a national, regional or district level, thereby bringing into doubt any analysis that seeks to establish a bar of significance within a region or a district. We sought no submissions on this point, because the comments by the High Court are arguably obiter as they relate to regional or district significance and the evidence in

---

100 Mr Brown, rebuttal evidence, paragraphs [48]-[49]
101 Man O’ War Station Limited v Auckland Council, CIV-2014-404-2064, paragraph [14]
this case by both parties assumed that regional significance was a threshold to be met, with the debate focussing on whether the bar for it had been set too high.

We start with the relevant proposed RPS provisions, because these set out the assessment criteria and generally provide the framework for the approach taken to the assessment of ONFL’s. We note that these seem to incorporate the factors that the case law has developed for assessing the significance of landscapes, starting with the Pigeon Bay/WEST factors, which are reflected in Policy 15(c) of the NZCPS.

The proposed RPS provisions

The provisions regarding ONFL’s and the policies relating to landscape (including seascape), natural character and amenity are included in Section 12 of the proposed RPS. The important policy for the purpose of this discussion is Policy 12.1, to which Implementation Methods 12.1.1 and 12.1.2 and the Explanation attached to them relate. Section 12A includes Table 12-1, which is the list of ONFL’s of regional significance and this is followed by the Maps showing them in regional context (Map12-1A) and specifically (the remaining maps). Section 12B includes Table 12-2, which sets out the landscape values and characteristics assessment criteria.

There are three ONFL’s within the coastal environment, but they are counted as one of the twelve considered by the Council to be of regional significance. All are part of ONFL10 which is entitled Coastal areas of the Coromandel. They are Cathedral Cove, Shakespeare Cliff and coastline south of Hahei (ONFL 10/1), the northern tip of the Coromandel peninsula and the western slopes of the Moehau Range out to coast (10/2) and Coromandel-Tuateawa (ONFL 10/3).

Policy 12.1 provides:

**Policy 12.1 Outstanding Natural Features and Landscapes**
Identified values and characteristics of outstanding natural features and landscapes (including seascape) of regional or local significance are protected from adverse effects, including cumulative effects, arising from inappropriate subdivision, use or development within or adjacent to the landscape or feature.

---

103 Section 12B as amended was included by a draft consent order as Exhibit 4
104 Arguably this means that there are in fact fourteen ONFL’s, although the three referred to are part of the ONF 10.
Implementation methods 12.1.1, 12.1.2 and 12.1.3 appear directly beneath Policy 12.1 and include:

12.1.1 Protect values of outstanding natural features and landscapes
Regional and District Plans shall identify and provide for the protection of the values and characteristics of outstanding natural features and landscapes, including those of regional significance identified in section 12A (Table 12-1).

12.1.2 Identify local outstanding natural features and landscapes
Waikato Regional Council will encourage territorial authorities to undertake a district-wide assessment of outstanding natural features and landscapes of local significance, the criteria in section 12B (Table 12-2) should be used as a basis of any new assessment.

12.1.3 Values of outstanding natural features and landscapes to tāngata whenua
Waikato Regional Council will work with tāngata whenua to confirm the values of significance to tanga whenua of the outstanding natural features and landscapes included in section 12A (Table 12-1) and ensure these are recognised in regional and district plans.

Implementation method 12.1.1 requires that plans (both regional and district) identify and provide for the protection of ONFLs, but the proposed RPS has also identified ONFL’s of regional significance in Table 12-1. We do not read method 12.1.1 as preventing a Regional Plan from adding to the ONFLs specifically listed in Table 12-1, despite the Explanation seeming to limit this to districts.

The Explanation to Policy 12.1 and the Implementation methods attached to it, highlight that there is benefit in using the same criteria to assess outstanding areas in regional and district plans. It is recognised:

...that the absolute boundaries of features and landscapes are difficult to define.

And it notes that

The focus of the policy and methods is on the values and characteristics of the outstanding features and landscapes (including seascapes) rather than on the features or landscapes themselves. This recognises that landscapes evolve over time and it is neither practical nor desirable to protect them in a particular state or at a particular point in time.

We do not agree that the NZCPS supports the interpretation of protect outlined in the Explanations as it has now been explained by the Supreme Court in EDS v King Salmon, if this Explanation leads to a position where regardless of whether the feature and landscape has been identified as outstanding and subject to protection, that protection does not apply because it is neither practical nor desirable to protect it in a particular state or at a particular point in time.
The assessment criteria used to determine regional and local (i.e. district) ONFL's as now proposed are set out in Table 12-2 as follows:

**12B Landscape values and characteristics assessment criteria**

**Table 12-2: Typical factors to consider when assessing landscapes**
The following criteria have been used as the basis for identifying outstanding natural features and landscapes of regional significance (as listed in Section 12A and mapped in Maps 12-1 to 12-15) and should be used as the basis for identifying outstanding natural features and landscapes of local significance.

<table>
<thead>
<tr>
<th>Attributes</th>
<th>Typical factors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physical Attributes</strong></td>
<td>Natural - the characteristics of intactness, health and significance of natural landscape features including:</td>
</tr>
<tr>
<td></td>
<td>• Geology, geomorphology, and resultant topography</td>
</tr>
<tr>
<td></td>
<td>• Hydrology (hydrological features and processes)</td>
</tr>
<tr>
<td></td>
<td>• Soil and natural vegetation</td>
</tr>
<tr>
<td></td>
<td>• Ecology (the health and significance of ecological attributes)</td>
</tr>
<tr>
<td><strong>Human (‘Cultural’)</strong></td>
<td>Human (‘Cultural’) - the characteristics of human features, any inherent cultural significance, and the manner in which they relate to the underlying natural setting including:</td>
</tr>
<tr>
<td></td>
<td>• Land use</td>
</tr>
<tr>
<td></td>
<td>• Human vegetation patterns</td>
</tr>
<tr>
<td></td>
<td>• Buildings, structures and settlements</td>
</tr>
<tr>
<td></td>
<td>• Road networks</td>
</tr>
<tr>
<td></td>
<td><strong>Human or cultural factors are relevant to landscape assessment in general.</strong></td>
</tr>
<tr>
<td></td>
<td>However, for assessment of outstanding natural features and landscapes the focus will be on natural areas where such human factors are recessive or absent.</td>
</tr>
<tr>
<td><strong>Aesthetic Attributes</strong></td>
<td><strong>Visual and aesthetic characteristics including:</strong></td>
</tr>
<tr>
<td>(perceptual, sensory, experiential)</td>
<td>• Expressiveness – the manner in which biophysical features (including landforms, water-bodies and natural vegetation) express natural processes and patterns</td>
</tr>
<tr>
<td></td>
<td>• Legibility (in the sense of way-finding and orientation) – the role of landscapes and features as landmarks, boundaries, areas with a distinctive character (taking the 3D sequential experience into account)</td>
</tr>
<tr>
<td></td>
<td>• Picturesqueness / Composition (including such attributes as the presence of water, contrast of shadow and light, perspective depth, focal-points, the mix of openness and enclosure, and the overall composition of landscape elements)</td>
</tr>
<tr>
<td></td>
<td>• Coherence (the manner in which different elements relate to each other including the intactness of natural landscapes and the extent to which human elements and patterns reflect the natural structure of the landscape)</td>
</tr>
<tr>
<td></td>
<td><strong>Account should be taken of attributes that may be only occasionally or seasonally present (such as wildlife or snow), and the effects of movement (wind, waves)</strong></td>
</tr>
<tr>
<td></td>
<td>i.e. the ‘transient factors’</td>
</tr>
</tbody>
</table>
[170] Mr Brown gave evidence of his involvement in developing the assessment criteria in Table 12-2 after the notification of the proposed RPS. He said he recommended revised assessment criteria be employed in Section 12, and these were incorporated in the staff report of December 2011 prepared for the proposed RPS hearings, then re-examined in the course of those hearings. As a result, the criteria provided the foundation for identification of the ONFLs listed in the decisions version of the proposed RPS.

[171] The criteria in Table 12-2 were appealed to this Court by *Federated Farmers*,\(^{105}\) which has resulted in the criteria being revised by the parties to it (not including ORRA). The Federated Farmers appeal has now been resolved by consent and a draft consent order has been submitted to the Court for approval. We refer to this in paragraph [22]. Table 12-2 listed above is the version that has been submitted to the Court for approval.

[172] Mr Brown was clear that although the revised criteria involved some changes from those employed by him in 2011, they nevertheless address the identification of ONFLs in a manner and via key criteria that are very similar to those employed in his review. We accept that the key criteria with the factors and thresholds in the draft consent order are sufficiently similar to those employed by Mr Brown in his review and in the decisions version of the proposed RPS.

[173] Mr Lockhart took no issue with the criteria themselves and we agree that they are appropriate. His critique of Mr Brown’s approach was twofold:

(a) he challenged whether or not Mr Brown’s opinion had been influenced by the approach taken in earlier landscape assessments done by others, which Mr Lockhart considered to be flawed; and

---

\(^{105}\) ENV–2012–313–000031

ORRA (Decision) Combined
(b) he challenged the way in which the criteria had been applied to Opoutere.

[174] Mr Lockhart said:\textsuperscript{106}

In particular, it is my opinion that Mr Brown (and other landscape assessments of the area), give too much weight to the perceived lack of 'naturalness' of the Opoutere area and the presence of forestry and residential settlement and the like and insufficient weight to other factors, particularly ecological, socio-cultural and heritage factors.

*The earlier landscape assessments*

[175] At the heart of this argument is the suggestion that Mr Brown may not have properly assessed the landscape values at Opoutere, because the basis upon which he proceeded was constrained by a purportedly flawed approach taken by earlier assessments.

[176] The first landscape assessment was the Waikato Regional Landscape Assessment dated February 2010\textsuperscript{107} ("the Buckland report") commissioned by the Waikato Regional Council, which as the name suggests was a regional landscape assessment.\textsuperscript{108} The Buckland report was peer reviewed by Boffi Miskell, an exercise completed in 2009.\textsuperscript{109} The Buckland report was completed before the NZCPS 2010 was finalised. The ONFLs identified in the Buckland report were carried through into the notified version of the proposed RPS.

[177] Mr Brown was commissioned by Thames-Coromandel District Council to prepare the Coromandel Peninsula Landscape Assessment dated September 2011 ("the Coromandel Peninsula assessment"), which, as the name suggests, was specific to the Coromandel Peninsula. The Coromandel Peninsula assessment has been used to identify outstanding natural landscapes and amenity landscapes in the proposed Thames Coromandel District Plan.\textsuperscript{110} We had no evidence about the specific provisions of that proposed District Plan, any submissions on or officer's reports related to submissions, or the outcome of any hearings.

\textsuperscript{106} Mr Lockhart, evidence-in-chief, page 177, paragraph [23].
\textsuperscript{107} By Mary Buckland, Chow Hill, O'Connor Manning Consultants & GHD
\textsuperscript{108} Relevant excerpts from this assessment are attached to Mr Lockhart's evidence-in-chief as Annexure 3, pages 207-212, Agreed Bundle
\textsuperscript{109} Mr Brown, evidence-in-chief, paragraph [6]
\textsuperscript{110} Relevant excerpts from this assessment are attached to Mr Lockhart's evidence-in-chief as Annexure 4, pages 213-222, Agreed Bundle

ORRA (Decision) Combined
In 2011, Mr Brown was also engaged to undertake a peer review of the Buckland report and in particular Section 12 of the proposed RPS when Boffa Miskell (the first peer reviewer) faced potential conflicts of interest.111

Mr Brown was also engaged by the Council to review all of the submissions made on the ONFLs included in the notified version in the proposed RPS.

The Buckland report

Mr Brown noted that neither Boffa Miskell nor he had the scope to reassess landscapes across the entire region. Both were asked if they could support the higher order landscapes identified as ONFLs, whether any refinement was needed in relation to the criteria employed to address the regions ONFLs, and subject to some “tweaking” of the criteria, whether other landscapes identified in the submissions to the proposed RPS might be added to the original list of ONFLs.

Mr Brown understood his task was to have regard to the regional context and to apply the same threshold that had been applied to the ONFLs identified in the Buckland report. Mr Brown described this exercise as follows:112

It involved fine-tuning rather than the sort of wholesale change that might have occurred with a re-evaluation of the entire Region. In my opinion, the bar had been set very high for the regions ONFLs, but this simply meant that any alterations or additions to them would have to meet the same exacting standards, as a few landscapes did. However, I did not anticipate that any of the draft ONFLs would be subject to radical surgery, although some – such as ONFL 8 addressing the Kaimai Ranges and ONFL9 focusing on Lake Taupo – were ultimately affected by more fine-grained reconfigurations.

Mr Brown agreed with the Boffa Miskell review of the Buckland report that it did not clearly distinguish between assessments of landscapes and natural character, a point of difference identified in the NZCPS 2010. He also agreed that the criteria adopted needed to be refined to take into account the modified Pigeon Bay/WESI criteria, however he said that he reached the view from the outset of his involvement with Section 12 that it would not be practical or desirable to rewrite the assessment method initially employed.113 Mr Brown did not elaborate about his reasons for reaching these conclusions and whilst we can understand the practicality of the situation (particularly as it relates to the cost of so doing), it is harder to understand

---

111 Mr Brown, evidence-in-chief, paragraph [4]-[6]
112 Mr Brown evidence-in-chief, paragraph [8]
113 Mr Brown evidence-in-chief, paragraph [27]
why it would be *undesirable* to review the assessment method if it is what sets the bar for regional significance, and particularly because Mr Brown seemed to have reservations about the bar having been set so high.

[183] Mr Lockhart considered the Buckland report to be deficient for the following reasons: 114

(a) It contained no assessment of Opoutere Beach, indeed the relevant section of the report is entitled *Eastern Coastline – River Mouths, Harbours and Islands* and refers to *landscape features* of which Wharekawa Harbour is one of a number of harbours mentioned.115 The inference is therefore that the harbour was assessed but not the ocean beach.

(b) The methodology used (in terms of classifying scores) was not consistently applied, with Wharekawa Harbour classified as an HVANFL (High Value Amenity Natural Feature and Landscape) and not an ONFL. To be an ONFL it required a score of 7 or more, particularly for *memorability* and *vividness*. Even though the Wharekawa Harbour received a score of 7, for reasons not explained it was classified as an HVANFL rather than an ONFL.

(c) The size of the area assessed compromised the quality of assessment. The Waikato Region covers most of the central North Island (approx 2.5 million hectares) and has 1,150 km of coastline, and an assessment of such a large area must necessarily lack depth. The quality of the assessment must be compromised to some degree by quantity.

(d) The report has inappropriately and unsatisfactorily included all of the islands, river mouths, harbours and islands of the eastern coastline of the Coromandel together. For example, Whangamata Harbour (an intensively developed harbour with a large marina and no wildlife of note) was rated the same as Wharekawa Harbour (an undeveloped, internationally116 recognised and protected wetland and home to a wide range of threatened bird species), with both being identified as HVANFL’s rated each with 7 points;

114 Mr Lockhart’s evidence-in-chief, paragraph [44], Agreed Bundle page 181
115 Agreed Bundle page 209
116 We have directly quoted Mr Lockhart here, but have already determined that the harbour may also be of international significance
(e) There are flaws or inaccuracies with the scoring process, to some extent caused by placing all of the eastern harbours of the Coromandel together. Mr Lockhart considered that if Wharekawa Harbour was being assessed (as opposed to all of the eastern Coromandel Harbours) it would score a high mark under the ecology criterion and probably under expressiveness, cohesion and eminence criteria, taking it comfortably into the ONLF category.

[184] The challenges by Mr Lockhart to the Buckland report in respect of Opoutere appear to be well made. In the end however, the relevance of this argument is the degree to which it influenced (if at all) Mr Brown’s assessment – a point to which we will return shortly.

*The Coromandel Peninsula assessment*

[185] The Coromandel Peninsula assessment is a district assessment and not a regional one, and the author was Mr Brown. The report divides the Coromandel Peninsula into 88 landscape units and categorises them as *outstanding* or *amenity landscapes*. Opoutere is divided into three units – Opoutere Beach, Wharekawa Harbour and Wharekawa Harbour Escarpment, each of which is classified as an *amenity landscape*.

[186] Mr Lockhart did not take particular issue with the criteria used in the Coromandel Peninsula assessment; but in his opinion:

(a) the way in which the criteria were applied to the landscapes being assessed was unclear;

(b) the weight given to each of the criterion and how the final rating is arrived at were unclear; and

(c) he did not agree that it was appropriate for Opoutere to be divided into three separate landscape units; rather he considered it should be assessed as a cohesive, whole and single unit.

[187] Mr Brown was cross-examined about this report. There was a challenge to the method used by Mr Brown to record his ratings of the landscape (shading a column on a box), as it was contended that this method does not clearly explain what criteria inform the rating and what weight has been attached to them. We consider
this in more detail below as this method was also adopted by Mr Brown to record his assessment of Opoutere against the proposed RPS criteria, but we signal that we agree with Mr Lockhart’s critique of it.

**Mr Brown’s involvement in the proposed RPS**

[188] We have outlined above how Mr Brown was involved in the proposed RPS and as we have already outlined there is no dispute that the criteria for assessment as they have eventually evolved are appropriate. As well as developing the assessment criteria however, Mr Brown reviewed the ONFL’s that had been included in Table 12-2 and he recommended that:

(a) All of the ONFLs identified in the Buckland report should be retained, but some of the boundaries of some of them, most notably the Kaimai Ranges and Lake Taupo, should be refined.

(b) The Waiotapu Geothermal Area and the Horohoro Escarpment and the Waikato River should be included in Table 12-2 as regionally significant ONFLs.

[189] Apart from not agreeing to include the Waikato River as an ONFL, the Council accepted Mr Brown’s recommendations.

[190] The focus of this part of our decision is to analyse whether or not the process adopted by Mr Brown in his assessment of the ONFL’s in Table 12-2, when considered in conjunction with his substantive analysis, was sufficiently robust to justify his conclusion that Opoutere should not be one of them.

[191] Mr Lloyd’s first challenge to the process adopted by Mr Brown was to refer to an inaccuracy in his review of submissions document. Under the heading of *Immediate Responses*, in dealing with the ORRA submission, Mr Brown wrongly (he conceded the mistake in cross-examination\(^{117}\)) referred very briefly to the Kuotatunu/Rings Beach area which he had rated as an ONFL, when it was not. No explanation was given for this error and it seems to be an unusual one to make, however it is not an error that goes to the heart of the matter. We also accept that Mr Brown had come into the assessment process quite late in the piece and he was asked

---

\(^{117}\) Mr Brown, evidence-in-chief, page 41
to respond to submissions on the proposed RPS in a way that essentially provided a summary or report.\textsuperscript{118}

[192] Mr Lloyd next challenged the process Mr Brown undertook in his assessment. This focussed on Mr Brown's analysis of the criteria and how he had weighted them. To begin with Mr Brown said that he had not undertaken an analysis that explored every one of the criterion in Table 12-2 in relation to this particular landscape, because he said that Opoutere does not come close to being an ONFL.\textsuperscript{119} If the ocean beach, the harbour and its margins are taken into account as the landscape, his opinion was that there are key elements which compromise it to such an extent that it could not be considered an ONFL. He described this as being clear.\textsuperscript{120}

[193] Mr Brown then appeared to take a different tack about the process he followed. He said that using his years of experience, he weighed up the various attributes of the landscape and reached a conclusion, summarising the different qualities and aspects of Opoutere that he considered to be important. He said that he had applied the criteria, but he had not done it in a structured manner.\textsuperscript{121} Mr Lloyd suggested that this was not a transparent approach.\textsuperscript{122} We agree.

[194] The appellant's next challenge was to the rating tables used by Mr Brown to record his assessment. Mr Lockhart contended that the rating tables used by Mr Brown were very similar to those used by Mr Brown in the Coromandel Peninsula assessment and were similarly flawed because there was insufficient information within them to indicate how or why the columns in these tables were shaded to the points they were, and nothing to indicate what degree of shading might qualify a natural feature and natural landscape to be outstanding.\textsuperscript{123} Mr Lockhart said:\textsuperscript{124}

\begin{quote}
Ultimately how much each of the bars under each of headings is shaded is largely subjective and how much shading is required to qualify as an ONFL is unstated. In other words the tables give an impression of scientific objectivity but are in reality are (sic) very subjective.
\end{quote}

\textsuperscript{118} Transcript, page 50, lines 7-11
\textsuperscript{119} Ibid, page 52, line 29
\textsuperscript{120} Transcript, page 43, lines 1-4
\textsuperscript{121} Ibid, pages 51-53
\textsuperscript{122} Ibid, page 49
\textsuperscript{123} Mr Lockhart, evidence-in-chief, paragraphs [50]-[54]
\textsuperscript{124} Ibid, paragraph [68]
[195] Under cross-examination Mr Brown referred to the key characteristics under the shaded columns which he contended helped to summarise some of the attributes and concerns about the landscape, but he accepted that the graphs leave readers none the wiser about the criteria in the proposed RPS that had been used.\textsuperscript{125}

[196] We agree with Mr Lockhart that the summary rating tables are less than clear and are not a useful way to record the criteria in Table 12-2 that have been taken into account.\textsuperscript{126} The importance of this is that the reader is not able to clearly identify the reasons why a conclusion about the rating of the landscape has been reached. We accept that the assessment of criteria is not a mathematical exercise, but it must be transparent, particularly for comparison purposes. We found the rating tables to be wanting in this regard.

**Finding**

[197] Despite the above, we are satisfied that Mr Brown reassessed Opoutere for the Court hearing with an open mind and still reached the conclusion that it did not qualify as an ONFL. In our view however, his conclusion was constrained by the approach adopted in the Buckland report and the bar set in it for regional significance, which was confirmed by the Council. We received no evidence about why the bar was set so high for the inclusion of ONFLs in the Waikato region and indeed for the coastal environment (a matter we return to). The impression we are left with is that had Mr Brown undertaken the initial assessment the bar might not have been set so high. This is important because the case proceeded on the basis that the ONFLs included in the proposed RPS must be both outstanding and of regional significance in terms of Policy 12.1 and Implementation method 12.1.1, although we note that the latter point might now be subject to debate. Mr Brown clearly felt constrained by the prior approach taken and was very fair in his acknowledgement of this during his evidence.

[198] The critical question is however where this takes us. We are satisfied that a conclusion can be reached about whether Opoutere is an outstanding landscape on the basis of the expert assessment of the criteria in Table 12-2 that does not completely depend on the rating tables, but rather the reasons given by the witnesses in evidence for their respective opinions. Our evaluation also needs to factor in that the NZCPS

\textsuperscript{125} Transcript, page 81
\textsuperscript{126} Mr Lockhart, evidence-in-chief, page 23
2010 was not in force at the time the initial landscape evaluation work was done, such work having effectively set the bar for outstanding and regional significance.

The application of the assessment criteria by the experts

[199] We return now to the substantive issue and the evidence about it. As we have said, we deal with the landscape inside the line delineated by Mr Lockhart on the basis that his assessment took into consideration all of the area included in Mr Brown’s line.

[200] The argument by ORRA is that Mr Brown’s ratings are incorrect because he did not give enough weight to ecological, socio-cultural and heritage factors which appear under the headings of Physical Attributes and Associate Attributes and over emphasised others (farming, production forestry and the presence of maritime pines) which are part of Human (“Cultural”) characteristics included under the heading Physical Attributes. ORRA submitted that Mr Brown, unlike Mr Lockhart, did not assess Opoutere in accordance with the procedure he formulated in Table 12-2 of the proposed RPS.

[201] In their Joint Witness Statement the two landscape witnesses provided a comparative rating of the factors in the Table 12-2 criteria on a five point scale (Very Low/Low/Moderate/High/Outstanding). That rating scale is not contained in the proposed RPS. While the rating comparison was accompanied by a useful summary of the key attributes for each witness that informed the rating, we also need to look more deeply into the evidence and the detailed analysis that formed the basis of Mr Lockhart’s assessment.

Physical Attributes

[202] Table 12-2 divides the factors to be considered under this heading in to two groups; those that are Natural and those of Human (“Cultural”) origin. Mr Lockhart rated the physical attributes of the site as Outstanding and Mr Brown rated them as High/Moderate (variable).

[203] In the Joint Witness Statement Mr Lockhart listed the key Natural attributes of the site as being the ecological values of the wetland and ocean spit, together with:

- a range of geographical features
• Wharekawa’s salt marsh-wetland-mangroves-river-estuary sequence
• the distal spit and its very high habitat values
• the dune corridor and ocean beach – connected with open ocean, Hikinui Island, Slipper Island etc
• the strip of pines and bush fringes.

[204] In the Joint Witness Statement Mr Brown agreed with most of the elements identified by Mr Lockhart, but he considered the overall naturalness of the physical attributes and their integrity to be compromised by the exotic pines behind the beach, the forestry plantings within the wider Wharekawa/Ohui landscape, and the settlement/farming activities. He said that the spit is exceptional as a habitat, but cannot be isolated from these other physical attributes.

[205] In his evidence Mr Lockhart described the ocean beach as an extensive, undeveloped white sand beach of approximately five kilometres in length, and he also described the dune system behind the beach:

...as good and as unmodified as dune system as I have seen anywhere in the Coromandel area...

And one which is:

...well coated in native grasses, primarily spinifex sericeus and pinago, the latter of which is very much in decline in New Zealand.

[206] Mr Lockhart referred to the dunes containing populations of the very rare dune snail (succinea archii) and the moko skink both of which are in serious decline and have disappeared from many other Coromandel beaches. He considered that the maritime pine forest behind the dune system provided a very effective buffer between the adjoining four hectare blocks and the dune system and the beach, and he said that

... it creates a very real sense of remoteness and isolation for the beach which is both rare and attractive.

[207] Mr Lockhart referred to the two NZ dotterel colonies at Opoutere beach, one at Ohui and one at the sandspit, the sculptural and gothic qualities of Hikinui Island

---

127 Mr Lockhart, evidence-in-chief, paragraph [23]
128 Ibid, paragraph [28]
129 Ibid, evidence-in-chief, paragraph [29]
130 Ibid, paragraph [27]
and the pohutakawa covering Ruahiwhiwi Point, at the mouth of the estuary or Wharekawa Harbour. Whilst acknowledging that the southern and western boundaries of the estuary comprise primarily farmland and forestry, Mr Lockhart considered its northern and eastern boundaries of the estuary to be dominated by Maungaruawahine, which he described as:  

..a visually impressive conical landform covered in mature coastal forest.

[208] Mr Lockhart highlighted the ecological significance of the estuary referring to the ecological values attached to its saltmarsh, seagrass and mangrove communities.  

[209] Mr Brown accepted that on ecological values alone, Opoutere is an extremely important site.

[210] Mr Lockhart highlighted that ecologically significant areas are seriously under-represented in the table of ONFLs set out in Table 12-1. He suggested that Mr Brown had favoured the purely visual/aesthetic over the ecological in his assessment, but Mr Brown contested this. Whilst he accepted that not a single estuarine wetland environment or ecosystem has made its way into Table12-1, Mr Brown explained that he had recommended that the area of the Waikato River that merges with the Whangamarino Swamp and the wetlands closer to the mouth of the river should be included in Table 12-1. Mr Brown told us that the hearings panel did not agree, as they considered that the river as a whole was too modified to meet the threshold set for ONFLs. Mr Brown also told us that he had suggested that the Council should look at outstanding natural features specifically and he still thought this was a task worthy of being undertaken.

[211] We accept that Mr Brown took into account the ecological significance of Opoutere when assessing the landscape and we also accept that ecological values are not an overriding factor, as Mr Brown pointed out. The critical question is whether in the overall landscape analysis sufficient weight was given to the ecological significance of Opoutere.

131 Ibid, paragraph [33]  
132 Mr Lockhart, evidence-in-chief, paragraph [33]  
133 Transcript pages 42-43  
134 Ibid, pages 43, 74 – 77  
135 Ibid, page 61  
[212] In relation to the key Human (Cultural) attributes of the site, Mr Lockhart relied on reports by Dr Louise Furey\(^{137}\) (and Dr Nicholson\(^{138}\)) to substantiate what he described as a rich Maori and Pakeha history in the area.\(^{139}\) He said that the area contains a large number of pa sites including Maungaruawahine and the Ruahiwihiwih headland where terracing is still evident to the naked eye, but he also referred to other early occupation sites indicated by the presence of bird and fish bones and the like. Dr Furey referred to middens of up to 700 years of age and early occupation sites in the area, the presence of which these days are a rarity on the Coromandel Peninsula and in the northern North Island. Some of these middens are visible particularly at the base of Maungaruawahine and on the estuary side of the spit. We acknowledge that neither Dr Furey nor Dr Nicholson gave evidence before us, but the references in Mr Lockhart’s evidence to their earlier reports were not challenged.

[213] Mr Brown did not consider the cultural and spiritual values for tangata whenua and historical and heritage associations in his assessment of landscape.\(^{140}\) He questioned whether these should be more appropriately addressed under s 6 (c) and (f) of the Act, but conceded that this approach would not necessarily be consistent with Policy 15(c) of the NZCPS 2010.

[214] With reference to Opoutere Village, Mr Lockhart described it as comprising:\(^{141}\)

...sparse low intensity housing mainly of the traditional NZ bach type, with the houses predominantly on a hill side overlooking the estuary.

Mr Lockhart accepted that there is human settlement and production forestry in the surrounding area. He considered that these do not materially detract from the overall sense of naturalness imparted by the other features, such as the harbour, sandspit, Maungaruawahine and the beach, and he highlighted that little or no human development can be seen from the beach.

**Aesthetic Attributes**

[215] Table 12-2 next includes the heading Aesthetic Attributes (perceptual, sensory, experiential). Factors to be assessed include visual and aesthetic

---

\(^{137}\) Tab 9 of ORRA’s submission to the Commissioners
\(^{138}\) Tab 8 of ORRA’s submission to the Commissioners
\(^{139}\) Mr Lockhart, evidence-in-chief, paragraph [82]
\(^{140}\) Transcript, page 56 line 27 – page 57 line 30
\(^{141}\) Mr Lockhart, evidence-in-chief, paragraph [34]
characteristics. Mr Lockhart rated these attributes as High/Outstanding, whereas Mr Brown rated them as Moderate.

[216] In the Joint Witness Statement Mr Lockhart summarised this as the combination of elements described under the heading of Physical Attributes experienced as one moves through the landscape. The factors under this heading include expressiveness and legibility. In his opinion the site displays high levels of both. He referred to the coastal fringe which includes mature pohutukawa transitioning into the estuary and salt marsh landscapes, together with views of the harbour that are important. He described the journey to the ocean as highly memorable; a progression that feels natural even if it is not 'natural' in the sense that landscape experts typically use the word.

[217] The Joint Witness Statement records that Mr Brown agreed with the key attributes identified by Mr Lockhart and considered that the ocean beach, combined with the spit, harbour mouth and Hikutui Island are particularly appealing and are local landmarks. However, he also considered that these values are compromised to some degree by the presence of open farmland and structures, pine forestry, the settlement, and exposure to smaller scale pockets of development (including the edge of the camping ground).

[218] In his evidence Mr Lockhart quoted excerpts from the Coromandel Peninsula assessment about the expressiveness of Opoutere with which he agreed. He referred to the interplay between the coastline and the ocean heightened by the remoteness of the beach, and expressive nature of the incoming and outgoing tide from the estuary, and the combination of the two. Because of its wildlife reserve and its relative lack of development, he said that there is an ability to appreciate the 'web of life' at Opoutere - that phrase having been used by Dr Nicholson in his report. 142

[219] Mr Lockhart also described highly visible transient values and as examples of this, he referred to the ebb and flow of the tide and the coming and going of migratory birds particularly in the dotterel colonies. He said that the close connection and interest that the local community has with the dotterel colonies is an additional factor that that should be taken into account. He referred to local volunteers being involved in counting chicks and being rostered to watch over the chicks when they are young. 

142 Dr Nicholson report, page 2 (no paragraph numbers provided in report)
[220] When dealing with legibility as a factor, Mr Lockhart described the area as a collection of distinctive landmarks and features that are arguably individually outstanding, but in his opinion most certainly outstanding when considered together. He noted that neither the Buckland report nor the Coromandel Peninsula assessment refer to Hikinui Island and Ruahiwhiwi Point, both of which are striking and memorable landforms in their own right, and he also noted that the Buckland report does not mention Maungaruawahine or the 5km long white sand beach.

[221] Another factor referred to under this heading is picturesqueness/composition. Mr Lockhart considered Opoutere to be highly picturesque. He specifically mentioned the presence of water of contrasting character (still waters and the ribbon of water left in the channel at low tide in the estuary, waters at the mouth and the surf waves of the ocean beach). He considered the combination of openness (the beach) and enclosure (the estuary enclosed by hills) to be distinctive and memorable.

[222] In terms of coherence (the manner in which different elements relate to each other)\(^{143}\), Mr Lockhart considered that the Opoutere landscape should include as a single cohesive unit the area marked on the map attached to his evidence-in-chief as Annexure 1. He said that Opoutere is a place that is very much the sum of its parts. In his opinion, the estuary is connected to the beach physically by the sandspit, but also by the ebb and flow of the tide and the dotterel colonies that occupy both the estuary and the beach sides of the sandspit and the other or Ohui end of the beach. Mr Brown considered that the level of coherence is variable, in places quite low - especially around Wharekawa Harbour and both ends of the ocean beach.

Associtative Attributes

[223] Associtative Attributes are described in Table12-2 as values or meanings associated with a landscape and there are number of factors to be assessed under this heading. Mr Lockhart rated the associative attributes of the site as Outstanding, whereas Mr Brown rated them as High.

---

\(^{143}\) The decisions version referred to coherence (and the Table 12-2 criteria are not exhaustive), as follows:

Coherence / Unity: reflecting the degree to which the landscape is visually cohesive, without discordant elements that adversely impact on its key characteristics and features, eg. subdivision high on the flanks of an otherwise predominantly 'natural' range or volcanic cone.
[224] In the Joint Witness Statement Mr Lockhart referred to the combination of Opoutere’s physical attributes, which in his opinion, because of the area’s historic and natural features, creates a unique coastal experience; an experience which he said is becoming increasingly rare. He described this experience as culminating in the ocean beach, where one experiences a sense of isolation; an experience which he said differentiated this beach from most of the Coromandel’s other more settled beaches.

[225] In the Joint Witness Statement Mr Brown agreed that Opoutere Beach has considerable appeal, but less so the Wharekawa Harbour catchment. In his opinion identity/sense of place, naturalness associations (wilderness etc) and other associative values are diminished somewhat by the various land uses and structures that intrude into parts of the landscape. He regarded the ocean beach as being similar in some respects to Hot Water Beach and Waikawau Bay, both of which have extensive ocean beaches, although these are currently subject to remediation of their dune systems and Hot Water Beach is also exposed to forestry at its northern end and a settlement at its southern terminus.

[226] Overall, Mr Lockhart’s opinion was that there are strong naturalness associations evident at Opoutere because of the ecological values evident there, the estuary and sand spit, and the undeveloped white sand beach backed by the maritime pine forest. He disagreed with Mr Brown that this forest, which he described as well-established and possibly part of Opoutere’s socio-cultural history, detracts from the experience, memorability or the naturalness of Opoutere. He said that the forest creates a sense of isolation and remoteness and associated tranquillity and that there are few places left in the Coromandel in which those feelings can be experienced, making Opoutere in general and the beach in particular, memorable. He considered the length, attractiveness and lack of development on Opoutere’s white sand beach to be striking and now rare on the Coromandel and in New Zealand. He described these characteristics as the essence of what he termed the Opoutere experience.

[227] On sense of place Mr Lockhart considered Opoutere in many ways to be the quintessential Coromandel experience, exhibiting a sense of how the Coromandel used to be.

[228] Mr Lockhart referred to the factor entitled recreational uses. He described these as being fundamentally quiet and low impact activities based on landscape qualities, identifying bird watching, fishing, shellfish gathering, kayaking, sailing of small craft and particularly walking as examples. He also referred to the track to the
summit of Maungaruawahine, multiple tracks through the forest behind the beach and the beach itself and he said there is a five knot speed limit over the whole of the estuary/harbour discouraging boating activities that are inconsistent with the overall quietness and tranquillity of Opoutere.

[229] In terms of emblematic attributes Mr Lockhart mentioned the reserve in the village dedicated to Michael King, the well-known NZ historian and author who lived and wrote at (and about) Opoutere until his death. He referred to a Bill Manhire poem entitled “Opoutere”.

Other matters

[230] As the criteria make clear, the list in the Table 12-1 is not exhaustive and other factors may be relevant and have greater or lesser weight depending on the circumstances.\textsuperscript{144}

[231] Mr Lockhart said that when landscape assessments are done, for consistency reasons there need to be comparisons carried out with other similar landscapes and Mr Brown did not seem to disagree. Evidence was given about Pakiri beach in the Auckland Region by Mr Brown. Mr Lockhart argued that Mr Brown had supported the inclusion of Pakiri beach as an ONFL in the Auckland Region, but it had large tracts of production forestry and farmland behind it.

[232] In cross-examination Mr Brown said Pakiri beach stretches for approx 20 km (compared with 5 km for Opoutere) and has a dune system that is well formed and culminates in the Mangawhai Heads, a major feature within and next to the Auckland Region. However he agreed that the pine forest behind it does not contribute positively to the values of the landscape.\textsuperscript{145}

[233] Mr Brown referred to the reasons for including Pakiri beach as an ONFL. He said that Pakiri beach, although nothing special in its own right, is an ONFL because it is the only major ocean beach down the eastern Auckland Region’s eastern coastline that remains substantially unaffected by settlement and other forms of overt development.\textsuperscript{146} Picking up on this, Mr Lockhart contended that, like Pakiri beach, Opoutere beach is surrounded on all sides by intensively developed beaches and

\textsuperscript{144} Note 2
\textsuperscript{145} Transcript, page 73
\textsuperscript{146} Mr Brown evidence-in-chief, paragraph [49]
coastline, because immediately to the north are Tairua and Puaianui and to the south are Onemana and Whangamata, however in cross-examination Mr Lockhart accepted that Opoutere is relatively undeveloped, not undeveloped.\textsuperscript{147}

[234] Mr Lockhart also considered that Opoutere is no less worthy than the three other areas of the Coromandel coast that have been scheduled as ONFL.

[235] Mr Lockhart also considered the \textit{night-time values}. He said he had stayed at Opoutere overnight on many occasions and could attest to the clarity of the night sky and the silence of the night apart from hearing sounds associated with the estuary and the beach, all evident because of the relatively sparse residential settlement in the area.

\textit{Are the landscape values at Opoutere outstanding?}

[236] In terms of the ONFL thresholds (whether a landscape is \textit{conspicuous}, eminent, especially because of excellence, and remarkable, and therefore outstanding),\textsuperscript{148} Mr Lockhart considered that the sum of Opoutere’s parts make it an ONFL, but Mr Brown disagreed. Mr Lockhart’s opinion (as expressed in the Joint Witness Statement) was that Opoutere combines a number of quintessential elements including the estuary edge with its mature pohutukawa and meandering road, arrival at the estuary, then the transition to the ocean beach to create what he described as a unique coastal landscape in the context of the Waikato. Mr Brown’s opinion was that these values are compromised by an awareness of the settlement and production forestry (in particular) at Opoutere’s gateway.

[237] In relation to the landscape values of Opoutere beach and spit, Mr Lockhart considered these to be outstanding. He agreed with Mr Brown that the key characteristics of Opoutere beach and spit are as follows:\textsuperscript{149}

\begin{quote}
Both the beachfront and its distal spit are strongly articulated, dramatic, and highly appealing features. Their profile and high aesthetic/recreational value are complemented by the off-shore islands, forested headland at the northern end of the beach and the primary dunes that flank – and enclose – the beachfront.
\end{quote}

\textsuperscript{147} Transcript, page 35, line 34
\textsuperscript{148} \textit{Wakadipu Environmental Society Incorporated and others v Queenstown-Lakes District Council}, C180/99 at paragraph [82]
\textsuperscript{149} Mr Brown, evidence-in-chief, page 24, paragraph [48], and Mr Lockhart, evidence-in-chief, page 197, paragraph [116], Bundle of documents
[238] However, the two differed in terms of the effect of land use on the landscape values of Opoutere beach and spit. Mr Lockhart considered the values subtly undermined by the presence of production forestry, farming and settlement in the surrounding environs, but not to the extent that the beach is anything less conspicuous, eminent, excellent and remarkable. Mr Brown disagreed. He considered the values were subtly undermined by the dominant pine forest behind the beach and the signs of both production forestry and to the south pastoral activities on rising hill country that frames both ends of the beach. He was also of the opinion that on the spit next to the mouth of Wharekawa Harbour both these signs of modification and development within the Opoutere settlement become much more apparent.

[239] Although Mr Milne suggested to Mr Lockhart in cross-examination that the landscape elements he described are common elsewhere, Mr Brown did not disagree with much of Mr Lockhart's analysis and neither do we. In attempting to summarise the key differences between the assessments of the two witnesses Mr Brown's rebuttal evidence states150:

... it is my opinion that Mr Lockhart focuses excessively on particular components of the Opoutere/Wharekawa Harbour – the ocean beach, spit and harbour area – without sufficient regard to those components that have an adverse effect in terms of the greater whole, including: the locality's pine forestry, its harvested areas, farming activity, the maritime pines behind the ocean beach, and the Opoutere settlement with its attendant roading, power lines, boat ramp and other infrastructure.

These elements ultimately limit the biophysical naturalness of the Opoutere landscape, together with its perceptual/aesthetic values and overall appeal – both in terms of the original Table 12-2 assessment criteria [and those criteria now agreed by consent order]. ...

Turning to the Joint Expert Witness [Statement] ...... it is notable that Mr Lockhart's ratings are consistently higher than my own ..... In my opinion, this ultimately distils down to Mr Lockhart having a stronger focus on Opoutere's spit area and ocean beach, whereas my analysis remains informed to a greater degree by surrounding areas of land and activity – both within the Opoutere/Wharekawa landscape and on its visible margins – that impart a sense of modification and development that erodes the overall character and value of the Opoutere landscape.

In this context I can only reiterate that I agree this landscape retains some natural elements that are very special; yet, this does not outweigh or supersede the influence of productive activities, the existing settlement, and other areas of residential development when looking at this landscape "in the round". As a result, I still do not believe that it meets the "outstanding" threshold associated with the other ONFLs identified in Chapter 12 of the PWRPS.

150 Mr Brown, rebuttal evidence, page 100, Bundle of documents
[240] Mr Brown’s evidence is persuasive that the whole of the area proposed by Mr Lockhart is not outstanding in terms of the assessment criteria that now effectively form part of Table 12-1 in the proposed RPS, but we find there is sufficient evidence to justify a finding that part of it, namely the Opoutere ocean beach and spit, is outstanding. We are mindful that Mr Brown’s view was that the ocean beach and spit area came very close to being an ONFL. We also note the Beca report of 9 September 2013 attached to Mr Brown’s evidence when dealing with the ONFL threshold described the white silica sand of Opoutere beach as iconic (the threshold in the proposed RPS at that time) in the context of the Coromandel itself.\textsuperscript{151}

[241] Our site visit was instructive and our own observations about the beach and spit confirm the key characteristics of it that Mr Lockhart described and are listed above. The sense of naturalness described by the experts was evident and there is definitely a sense of remoteness from human development experienced from almost the entire beach. We agree with Mr Lockhart that it is uncommon to find such an undeveloped beach on the Coromandel Peninsula. As to the presence of the maritime pines, they should not be treated in our view in the same way as production forestry. We are not aware of any plans to remove them, and although not indigenous, we agree with Mr Lockhart that they do not detract from the naturalness of the beach and spit but add to their aesthetic and associative attributes. As well, whilst there is some development near the Ohui end of the beach, it is nothing like the developments that are backdrops to beaches to the north and south of it. This is a factor that should be given more weight than Mr Brown gave it.

[242] In relation to the estuary however, we cannot ignore the presence of farming and production forestry which was a relatively strong visual element within the surrounding landscape. We are satisfied that Mr Brown properly took into account the ecological values of the estuary in his assessment, but we agree that from a landscape perspective the presence of the other strong visual elements we have referred to, even if coupled with the socio-cultural factors mentioned earlier, mean that this area cannot be considered outstanding. It may be that a more nuanced approach with assessment criteria for natural features would result in a different outcome; and we have noted our unease about this, however we have concluded that it is not an option open to us to pursue.

\textsuperscript{151} Page 62, paragraph [2.4], Bundle of documents
Is Opoutere (part or all of it) regionally significant?

[243] There was a considerable amount of evidence addressed at whether or not Opoutere could be said to be regionally significant from a landscape perspective.

[244] Mr Lockhart referred to three other areas of the Coromandel coast scheduled in Table 12-1 as ONFLs and did not take issue with these, but considered that Opoutere is no less worthy of inclusion. He said that Cathedral Cove is self-evidently included because of its dramatic cathedral-like cliff faces and rock formations, but it is modified by its pathways and car/bus stops and inferentially, because of its attraction to visitors, it does not engender a sense of remoteness or isolation. In cross-examination, Mr Brown mentioned other factors that justified the inclusion of the Cathedral Cove and surrounds. Mr Lockhart said that Mr Brown has a preference, exclusively it would seem, for the large, obvious landscapes and appeared to exclude from consideration smaller landscapes, like Opoutere, that require a more nuanced assessment.

[245] As well as referring to Pakiri beach, beaches within the Coromandel Peninsula that had not been included as ONFL's were referred to in evidence. Mr Brown referred to New Chums Beach and even much of Hot Water Beach as undeveloped beaches surrounded by well-developed beaches. Mr Brown considered that other less modified beaches, such as those found within Waikawau Bay and at New Chums Beach to be more natural, expressive, isolated and overall unique at the regional level. He felt that those beaches come closer to being outstanding at the regional level than Opoutere and the Wharekawa Harbour. In his opinion, Opoutere is a ‘step’ below these other beaches when evaluated against the agreed criteria. Mr Brown considered Opoutere to be less than an ONFL in terms of the Waikato Region.

[246] Whilst we accept that comparisons are helpful in a general way, they are not determinative and at times not particularly useful because each landscape will be different. However, there is a further reason for questioning the basis of the comparisons made in this case which we now go on to discuss.

[247] Mr Brown gave evidence that he considered the bar had been set quite high and that he would have set it lower and included more areas as ONFL if he had done

---

152 Transcript, page 76
153 Ibid, pages 76 – 77

ORRA (Decision) Combined
the initial work. He said that some regionally important landscapes had not currently been captured including possibly New Chums’s Beach and Waikawau Bay. When asked by the Court whether a lower bar would have included either the beach or the spit, or the harbour, Mr Brown said that it would not have included the harbour, but it might have included the beach.

[248] In his opening submissions for ORRA, Mr Lloyd referred to Mr Brown’s acknowledgement that the bar for ONFL’s was set at a high level and he posed the following questions:

(a) Why should the bar have been set so high?

(b) Who dictated that we should be so parsimonious with what qualifies as an outstanding landscape?

[249] There is nothing in the proposed RPS to explain why the bar has been set at such a high level, but it is clear to us, that Mr Brown felt constrained to follow the approach taken in the Buckland report. As a result, his analysis in relation to Opoutere started with the focus on exclusion rather than inclusion and seemed to be heavily weighted with reference to the other landscapes that had been included in Table 12-1, most of which were not in the coastal environment. We do not consider that applying the same approach to identifying the values and characteristics of outstanding natural features and characteristics in the coastal environment to the region generally, adequately gives effect to Objective 2 and Policies 7 and 15 of the NZCPS 2010. It follows that the exclusion of New Chums Beach and Hot Water Beach from Table 12-1 cannot be used as a reason for not including the ocean beach and spit at Opoutere.

[250] Accordingly, the inference we reach from Mr Brown’s evidence is that absent the bar which focussed on the whole of the region not the coastal environment within the region and which we have found constrained his approach, he may well have considered the beach and the spit to be outstanding within the region’s coastal environment.

[251] It was put to Mr Lockhart that he did not undertake a regional landscape assessment as part of his evidence. The inference we were indirectly being asked to draw from this, was that absent such an assessment Mr Lockhart was not in a position

---

154 Ibid, pages 91-92
to form an opinion about the regional significance of this landscape. We have already referred to the need in our view for Opoutere to be assessed in relation to the region’s coastal environment. In this regard, the evidence of both experts focussed on comparative coastal environments within the Coromandel Peninsula, rather than for example those on the west coast. Because of both these things, we do not find the evidence of either expert much help on this aspect of the case.

[252] In relation to the beach and spit however, there is a wildlife refuge, and we have the ecologists’ evidence that the avian values present are nationally significant, and there are also the other terrestrial values associated with the dunes. The beach and spit landscape that support these values are significantly natural and undeveloped. We consider that we are able to draw from this evidence to support out conclusion that the beach and spit are a regionally significant landscape.

Conclusion

[253] For the reasons we have outlined above, we find the beach and spit to be an outstanding landscape, and therefore an ONFL is terms of the proposed RPS. As to its regional significance (leaving to one side that this may not be the correct test), we find that the bar for the selection of an ONFL in the context of the Waikato Region was set very high at a time well before the finalisation of the NZCPS 2010, which requires identification of outstanding landscapes to be done in the context of the coastal environment of the region. We are satisfied that there is sufficient evidence to establish that the beach and spit are significant within the Waikato regional coastal environment.

[254] We find that including Opoutere beach and spit in Table 2-2 of the proposed RPS as an ONFL would be an important step in recognising and providing for the protection of it as required by 6(b) and Policy 15 of the NZCPS 2010.

[255] In the light of this finding, we need to determine exactly where the boundaries of the ONFL for the beach and spit are on a map suitable for inclusion in the proposed RPS. We conclude that the two landscape experts should confer on where the line should be drawn to demarcate that ONFL. When questioned we note that Mr Lockhart said that the ONFL should include the areas experienced from the beach and extend south across the harbour entrance.\footnote{Transcript, page 43}

\footnote{Transcript, page 43}
The s32 report on submissions carried out by the Council staff recommended that ORRA’s submission that Opoutere be recognised as an ONFL be rejected in the following terms:  

Field assessment of the areas identified in the submission by a landscape architect indicates that even though the Opoutere spit and ocean beach are highly distinctive and attractive, this part of the Coromandel Peninsula is currently too affected by both residential settlement, production forestry and wilding pines – including their spread along the immediate beach hinterland and over nearby headlands - to qualify as an ONL. Although significant at the local/district level, the subject area is not identified as a proposed ONL in the recent (2007-2011) district assessment and this landscape is not considered sufficiently ‘eminent, remarkable, or outstanding at the regional level.

In terms of the matters we need to turn our attention to under section 32, we are not required to address the objectives, policies or even implementation methods of the proposed RPS for outstanding natural features and landscapes. We are evaluating whether an additional ONFL should be added to Table 12-1 and its mapped extent shown on the overview map (Map 12-1A) and an additional more detailed map (a new Map 12-16). The landscape experts gave evidence on the basis of factors and an outstanding threshold set out in Table 12-2 of the proposed RPS in the draft consent order. We have already noted that a note to Table 12-2 makes it clear that those factors are not a list or exhaustive.

As will be apparent, after extensive evidence including cross-examination, we have come to a different conclusion from that which was made at the first instance. We are satisfied that Opoutere beach and spit are an ONFL and should be included as such in the proposed RPS.

Overall conclusion

We conclude that the purpose of the Act will best be achieved by the decision we have made, which is to identify the following areas in the proposed RPS:

(a) The mapped area identified by Mr Kessels in Exhibit 3 as an area of ecological significance (or similar nomenclature), including any explanation thought necessary (see paragraphs [105] to [107]); and

(b) The ocean beach and spit as an ONFL in Table 12-1.

ORRA (Decision) Combined
[260] We direct the parties to confer and provide the Court with the appropriate maps to accord with our decision. There will need to be some discussion about whether or not the Ruahitiwiwi headland, Hikinui Island and Mototaua Rock should be included (our tentative view is that they should), but if the parties are unable to agree we will determine this matter and any other dispute about the extent of the ONFL at a later date.

SIGNED at AUCKLAND this 9th day of June 2015

For the Court

\[sign\]

M Harland
Environment Judge
JUDGMENT OF THE HON JUSTICE KÓS

Introduction

[1] Do regional councils have statutory authority to make rules to control land use for the purpose of maintaining indigenous biological diversity?

[2] The Manawatu-Wanganui Regional Council is promulgating a combined regional policy statement and regional plan. The statement identifies the regional council as the local authority with responsibility for developing rules controlling the use of land for the purpose of maintaining indigenous biodiversity. The plan sets out those rules. Everyone accepts that someone may make rules controlling the use of land for the purpose of maintaining indigenous biodiversity. The question here is whom may do so.
[3] In the Environment Court the appellant, Property Rights In New Zealand Incorporated (PRINZ), and Federated Farmers of New Zealand contended that the regional council had no such power. Rather the power vested in territorial authorities (district and city councils). The respondent Council contended that the power vested in it to determine whether such rules were made at regional or territorial level. The territorial authorities did not participate in this argument. They had been consulted on the proposed plan. Some made submissions. None opposed or appealed the indigenous biodiversity provisions.¹


[5] PRINZ appeals that decision to the High Court. On this occasion it is not supported by Federated Farmers.

Background

Statutory scheme

[6] Section 30(1) of the Act provides, in part:

30 Functions of regional councils under this Act

(1) Every regional council shall have the following functions for the purpose of giving effect to this Act in its region:

(a) the establishment, implementation, and review of objectives, policies, and methods to achieve integrated management of the natural and physical resources of the region:

(b) the preparation of objectives and policies in relation to any actual or potential effects of the use, development, or protection of land which are of regional significance:

(c) the control of the use of land for the purpose of—

(i) soil conservation:

¹ Indeed, two have relied on them already in notifying their own district plans.
(ii) the maintenance and enhancement of the quality of water in water bodies and coastal water:

(iii) the maintenance of the quantity of water in water bodies and coastal water:

(iiiia) the maintenance and enhancement of ecosystems in water bodies and coastal water:

(iv) the avoidance or mitigation of natural hazards:

(v) the prevention or mitigation of any adverse effects of the storage, use, disposal, or transportation of hazardous substances:

... (ga) the establishment, implementation, and review of objectives, policies, and methods for maintaining indigenous biological diversity:

...

Paragraph (ga) was added by the Resource Management Amendment Act 2003. The background to the amendment was as follows.

[7] In February 2000 the government issued the New Zealand Biodiversity Strategy. It was issued in part-fulfilment of New Zealand's international obligations under the 1992 Rio Convention on Biological Diversity. The Strategy document had the goal of establishing a framework to arrest the decline in indigenous biodiversity that had followed settlement and subsequent human exploitation of the country's natural resources. The Strategy records that New Zealand, one of the last places to be settled by humanity, has gone on to achieve one of the worst records of indigenous biodiversity loss on the planet. There was the loss of our larger bird species following initial human habitation. By the start of the seventeenth century about a third of the country's original forests had been replaced by grasslands. From the mid-nineteenth century expanding European settlement “started a new wave of forest destruction”. A further third or so of our original forestation has been converted to farmlands. Extensive modification of wetlands, dunelands, river and lake systems, and coastal areas has also occurred.²

The same month a ministerial advisory committee proposed that regional councils take a lead role in managing biodiversity affected by private land management. One consideration influencing that view was that regional council administrative boundaries, being catchment-based, more closely aligned with ecological boundaries than did territorial boundaries. Another was that regional councils' existing biophysical functions generally were more closely related to biodiversity management than the broader functions of territorial authorities, so that regional council staff held expertise in many areas of direct relevant to biodiversity.

In its final report, in August 2000, the committee recommended that regional councils take the — not just a — primary governance role in indigenous biodiversity:

On the question of sub-national governance, we have firmed in our preliminary views that regional councils should assume the primary governance role for biodiversity.

In our preliminary report we identified a number of reasons for our preference for regional council leadership. Further policy work supported our reasoning, as did the majority of submissions. Some urged that the contribution of territorial authorities should not be under-estimated (or under-valued). We agree, and our proposal for regional leadership should not be construed as being critical of territorial authorities. We do, however, find the case for a regional integrated approach compelling.

The committee acknowledged that giving both regional councils and territorial authorities biodiversity responsibilities would create an overlap in functions. It thought that an "unavoidable necessity", but not unworkable given that similar overlap existed for hazardous substances and natural hazards.

The May 2001 report of the Local Government and Environment Select Committee recommended that regional councils' functions be expanded by allowing "regional councils to contribute to biodiversity management through the

---


5. At 69.
establishment of methods as well as policies and objectives". As to overlap, the select committee said:

Issues of overlap between the biodiversity management functions of regional councils and territorial authorities should be resolved through the regional policy statement process, in the same way that overlap issues are resolved for the management of natural hazards and hazardous substances. An amendment to proposed new section 62 will require that the regional policy statement state which local authority has responsibility for dealing with the maintenance of indigenous biological diversity.

[12] One result of this policy analysis was the addition of s 30(1)(ga). Others were amendments to ss 62 and 65. I will set s 62 out in full, as it is central to the disposition of this appeal:

62 Contents of regional policy statements

(1) A regional policy statement must state—
(a) the significant resource management issues for the region; and
(b) the resource management issues of significance to iwi authorities in the region; and
(c) the objectives sought to be achieved by the statement; and
(d) the policies for those issues and objectives and an explanation of those policies; and
(e) the methods (excluding rules) used, or to be used, to implement the policies; and
(f) the principal reasons for adopting the objectives, policies, and methods of implementation set out in the statement; and
(g) the environmental results anticipated from implementation of those policies and methods; and
(h) the processes to be used to deal with issues that cross local authority boundaries, and issues between territorial authorities or between regions; and
(i) the local authority responsible in the whole or any part of the region for specifying the objectives, policies, and methods for the control of the use of land—
   (i) to avoid or mitigate natural hazards or any group of hazards; and

---

6 Resource Management Bill 1999 (Local Government and Environment Select Committee Report) at 24. That Bill did not progress. The Resource Management Amendment Bill (No 2) 2003, based on part of the 1999 Bill was then introduced in March 2003, and was assented to in May 2003.
7 At 24.
(ii) to prevent or mitigate the adverse effects of the storage, use, disposal, or transportation of hazardous substances; and

(iii) to maintain indigenous biological diversity; and

(j) the procedures used to monitor the efficiency and effectiveness of the policies or methods contained in the statement; and

(k) any other information required for the purpose of the regional council's functions, powers, and duties under this Act.

(2) If no responsibilities are specified in the regional policy statement for functions described in subsection (1)(i)(i) or (ii), the regional council retains primary responsibility for the function in subsection (1)(i)(i) and the territorial authorities of the region retain primary responsibility for the function in subsection (1)(i)(ii).

Notably there is no default provision in s 62(2) to determine who has primary responsibility for the function described at s 62(1)(i)(iii), in the event that the regional policy statement fails to make an express allocation.

[13] But the key point to be taken from s 62(1), after its 2003 amendment, is that it is the regional policy statement – a regional council instrument – that is to identify the “local authority responsible ... for specifying the objectives, policies and methods for the control of the use of land ... to maintain indigenous biological diversity”. Both regional councils and territorial authorities are “local authorities” for the purposes of the Act.

[14] Section 65 was also amended consequently in 2003. Section 65(1) reads:

65 Preparation and change of other regional plans

(1) A regional council may prepare a regional plan for the whole or part of its region for any function specified in section 30(1)(c), (ca), (e), (f), (fa), (fb), (g), or (ga).

That provision empowers a regional council to prepare a regional plan for the function specified in s 30(1)(ga). There is no mention there of the functions described in s 30(1)(a) and (b). The same exception is carried through in s 68(1)(a). As the Environment Court said in its decision, these exceptions make perfect sense. A regional council does not need to make rules about establishing, implementing and
reviewing, or preparing, objectives, policies and methods - the functions described in s 30(1)(a) and (b).

[15] Finally, I note two further provisions. First, s 31 of the Act defines the functions of territorial authorities. It reads, in part:

31 Functions of territorial authorities under this Act

(1) Every territorial authority shall have the following functions for the purpose of giving effect to this Act in its district:

(a) the establishment, implementation, and review of objectives, policies, and methods to achieve integrated management of the effects of the use, development, or protection of land and associated natural and physical resources of the district:

(b) the control of any actual or potential effects of the use, development, or protection of land, including for the purpose of—

(i) the avoidance or mitigation of natural hazards; and

(ii) the prevention or mitigation of any adverse effects of the storage, use, disposal, or transportation of hazardous substances; and

(iia) the prevention or mitigation of any adverse effects of the development, subdivision, or use of contaminated land:

(iii) the maintenance of indigenous biological diversity:

... It may be noted that paragraph (b)(iii) was added in its present form in 2003. Secondly, there is s 75(4). It provides that a district plan cannot be inconsistent with a regional plan.

Proposed One Plan

[16] As I mentioned in the Introduction, the Council has promulgated a combined regional policy statement and regional plan. There is a power to do so in s 80(2) of the Act. The proposed instrument is called the “One Plan”. As it is still a proposed plan (and statement) it has become known as the “POP”. The POP was notified in
May 2007. Its function is to replace the current regional policy statement and six operative regional plans. It received over 400 submissions. Seven affected territorial authorities made submissions. Following a hearing at Council level, the Council made decisions on the POP. Appeals against those decisions are now being heard by the Environment Court.

[17] One of the submissions came from the appellant, PRINZ. Another from Federated Farmers of New Zealand (Federated Farmers). Their submissions, as far as relevant to this appeal, concerned policy 7-1 and rule 12-6 of the POP.

[18] Policy 7-1 (in the decisions version) reads:

**Policy 7-1: Responsibilities for maintaining indigenous biological diversity**

In accordance with s 62(1)(i) RMA, local authority responsibilities for controlling land use activities for the purpose of managing indigenous biological diversity in the Region are apportioned as follows:

(a)  **The Regional Council must be responsible for:**

(i) developing objectives, policies and methods for the purpose of establishing a Region-wide approach for maintaining indigenous biological diversity, including enhancement where appropriate

(ii) Developing rules controlling the use of land to protect areas of significant indigenous vegetation and significant habitats of indigenous fauna and to maintain indigenous biological diversity, including enhancement where appropriate.

(b)  **Territorial Authorities must be responsible for:**

(ii) retaining schedules of notable trees and amenity trees in their district plans or such other measures as they see fit for the purpose of recognising amenity, intrinsic and cultural values associate with indigenous biological diversity, but not for the purpose of protecting significant indigenous vegetation and significant habitats of indigenous fauna as described in (a)(ii) above.

(c)  **Both the Regional Council and Territorial Authorities must be responsible for:**

(i) recognising and providing for matters described in s 6(c) RMA and having particular regard to matters identified in s 7(d) RMA when exercising functions and powers under the RMA, outside the specific responsibilities allocated above,
including when making decisions on resource consent applications.

So it would seem that the policy contemplates the Council having overarching responsibility for developing objectives, policies and methods (which include rules) concerning indigenous biodiversity at a region-wide level, and making rules concerning the use of land to maintain indigenous biodiversity. The territorial authorities have a subordinate role.

[19] Rule 12-6 (again in the decisions version) classifies various activities (including vegetation clearance, forestry and diverting water) as discretionary activities where they take place within a rare, threatened, or at risk habitat. That decision itself is controversial. Some appeals contend that the classification should be non-complying. That status would impose a higher threshold for consent: non-complying activities must not be consented if their effects are more than minor or they will otherwise be contrary to the relevant objectives and policies of the plan. If they pass those thresholds, they are considered then on the same basis as a discretionary activity.⁸

[20] PRINZ and Federated Farmers took a different view. They did not think the Council should be making land use rules at all in the area of indigenous biodiversity. They took the view that the Council's powers to control land use were confined to the purposes stated in s 30(1)(c) – soil conservation, water quality and the like.

[21] The Environment Court hearing the appeals on the POP resolved to determine this question as a preliminary issue.

**Environment Court decision**

[22] The Environment Court held that the functions of the Council regarding land use controls were not confined to those set out in s 30(1)(c). It said:⁹

---

⁹ *Federated Farmers of New Zealand v Manawatu-Wanganui Regional Council* [2011] NZ EnvC 403 at [6].
There is nothing magic about (c) – it is not a code of purposes by which a regional council is confined in its objective, policy or rule making powers.

Section 30(1)(ga) made it a mandatory function of every regional council to establish objectives, policies and methods for maintaining indigenous biodiversity. That did not exclude rules affecting or controlling the use of land. The Court said:\(^{10}\)

If it is reasonably necessary to control the use of land in some way to fulfil the requirement, then there is nothing in s 30 to prohibit that.

The Court concluded:\(^{11}\)

The short point is that s 30(1)(ga) means what it says. Regional Councils are required to establish, implement and review objectives, policies and methods (including rules) for maintaining indigenous biological diversity. The content of those objectives, policies and rules may be the subject of debate, but the power of the Council to establish them, subject to process, is beyond doubt.

**Submissions**

**PRINZ**

[23] A member of PRINZ, Mr Mike Plowman, argued the case for PRINZ. There was some irony in his doing so. He is an elected regional councillor of the respondent Council. Mr Plowman’s argument, in essence, was that notwithstanding s 30(1)(ga), regional councils do not have rule-making power to control land use to protect areas of significant indigenous vegetation and fauna. Section 31(1)(b)(iii) is clear in giving territorial authorities the function of controlling land use for the purpose of maintaining indigenous biodiversity. Mr Plowman argued that a regional council does not have the power to allocate to itself functions that are allocated to territorial authorities by the Act – here s 31(1)(b)(iii). Those functions must first be transferred from the territorial authority to the regional council under s 33.

[24] Secondly, s 68(1) precludes the regional council including rules for the purpose of carrying out s 30(1)(a) and (b) functions. That, says Mr Plowman, impliedly also includes the s 30(1)(ga) function which is effectively assimilated

\(^{10}\) At [7].

\(^{11}\) At [14].
within s 30(1)(a) and (b). Some support for that submission is to be found in *Brokers Resource Management* where it says:12

Section 68(1) limits the powers of regional councils to make rules in relation to functions conferred by s 30(1)(a), 30(1)(b) and 30(1)(ga). Rules are clearly envisaged by paragraphs (c) to (g), which relate to control. Accordingly, where Part 2 matters are relevant to the functions covered by paragraphs (c) to (g) those matters may be dealt with by way of rules as well as by objectives and policy. [Emphasis added].

[25] Thirdly, Mr Plowman conceded (as did Mr Gardner for Federated Farmers) that “methods” in s 30(1)(ga) includes rules. Later Mr Plowman sought to withdraw that concession. Ultimately he sought to maintain a “methods” within s 30(1)(ga) contemplated only non-regulatory responses.

*Council*

[26] On behalf of the Council, Mr John Maassen argued that s 30(1)(ga), together with other key provisions in Part 4 of the Act, gives regional councils statutory authority to control land use for the purpose of maintaining indigenous biodiversity. That, he said, was the direct consequence of the 2003 Amendment Act. Particular provisions Mr Maassen relied on were ss 30(1)(ga), 62(1)(i)(iii) and 68(1). He submitted also that the planning context supported the Council’s interpretation. The word “methods” is used in the Act, and in s 30(1)(ga) in particular, can include both rules and non-regulatory methods.

[27] Mr Maassen referred also to the legislative history discussed earlier, and to the social and local authority context. He noted that the evidence suggested that the region had within a five year period experienced a loss of 1,322 hectares of indigenous vegetation, particularly in lowland areas. As the ministerial advisory committee had noted in 2001,13 regional boundary and catchment-related scale were better suited to the management of indigenous biodiversity through the management of catchments and land forms than distributed territorial authorities. In addition, regional councils possess the necessary scientific knowledge, experience and data to achieve integrated management of indigenous biodiversity. He noted in this case

12 *Brokers Resource Management* (online looseleaf ed, Brokers) at [A30.04(2)].
13 See at [8] above.
there was apparent support from the seven territorial authorities affected for the jurisdictional approach taken in the POP.

\textit{Federated Farmers}

[28] Federated Farmers of New Zealand was a party to the original appeal. It is not an appellant in the present proceeding, as it does not support PRINZ’s appeal. However Mr Richard Gardner made helpful submissions indicating the position of Federated Farmers. In essence Federated Farmers would have preferred the jurisdiction issue not be dealt on a preliminary question. However the reality is that the Environment Court has set that preliminary question, resolved it and this is an appeal from it. On the substance of the appeal Mr Gardner did not support the argument by PRINZ that a regional council may not include rules in its regional plan related to indigenous biodiversity. He agreed with the finding of the Environment Court that “methods” in s 30(1)(ga) can include rules.

\textbf{Analysis}

[29] Five points need to be made.

[30] First, s 68(1) plainly empowers the Council to make rules for the purposes of carrying out any functions conferred on it under the Act, save those in s 30(1)(a) and (b). Parliament did not see fit to also except s 30(1)(ga). By virtue of the latter provision, one of its functions is the establishment, implementation, and review of objectives, policies, and methods for maintaining indigenous biological diversity. So plainly the Council may make rules in its regional plan – here the POP – for that purpose. On the face of the Act there is no basis to exclude it doing so in relation to the use of private land. There is no apparent or valid basis to assimilate the s 30(1)(ga) function within s 30(1)(a) and (b), as PRINZ submits. The passage in \textit{Brookers Resource Management} cited earlier\footnote{At [24].} and which suggests otherwise is incorrect. The function in s 30(1)(ga) also embraces controls on the use of land – as the third point made below confirms.
[31] Secondly, s 30(1)(ga) creates a mandatory obligation on the part of regional councils to make objectives, policies and methods for the maintenance of indigenous biological diversity. Such methods may include rules. The Council contends that. Federated Farmers concedes that. PRINZ did likewise until the implications of its concession became plain. At the end of the day, s 68(1) confirms that. More generally, a “method” is what it says: a way of doing something. In its RMA context it may include rules. Sections 31(2), 32(4)(a), 67(2)(b) and 75(2)(b), for instance, all make that abundantly clear. Methods are not confined to rules (there may be non-regulatory methods too), but necessarily they may include rules.

[32] Thirdly, it is true that s 30(1)(c) provides that it is a function of a regional council to control the use of land for certain purposes. The maintenance of indigenous biodiversity is not expressly named within that provision. I do not however accept that it is consistent with the purpose of the 2003 amendment to read down s 30(1)(ga) so that it includes every relevant function apart from controls over the use of land. Context suggests that was not what Parliament intended. Rather, s 30(1)(ga) was located outside of s 30(1)(c) simply because that function is broader than the control of the use of land - although it may include such controls.

[33] Fourthly, it is also true that s 31(1)(b)(iii) gives territorial authorities a similar function, specifically in relation to controls over the use of land. Such controls are the particular concern of territorial authorities, just as air, water and the coastal marine area (the latter on a shared basis) are the particular concern of regional councils. But the existence of a functional overlap was expressly anticipated by the legislature, as the select committee report discussed earlier demonstrates.\textsuperscript{15} Parliament resolved the potential conflict in two ways. First, by the 2003 amendment made to s 62, concerning the mandatory requirements of regional policy statements. Such a statement must be prepared by the relevant regional council.\textsuperscript{16} And by reason of s 62(1)(i) it is specifically the regional council, through its regional policy statement, that is to decide which local authority (i.e. the regional council or the relevant territorial authority)\textsuperscript{17} is to be responsible for specifying the objectives,

\begin{flushright}
\textsuperscript{15} At [10].
\textsuperscript{16} Section 60(1).
\textsuperscript{17} See s 62(2).
\end{flushright}
policies, and methods (i.e. including rules) for the control of the use of land to avoid or mitigate natural hazards and hazardous substances – and to maintain indigenous biodiversity. Policy 7-1 is exactly the exercise of allocative responsibility intended by that provision. The regional policy statement may determine that a territorial has either some or no rule-making role in relation to controls of land use to maintain indigenous biodiversity. Secondly, s 75(4) resolves any residual conflict between regional and territorial plans. It provides that a district plan cannot be inconsistent with a regional plan.

[34] Finally, as the responsibility is given to regional councils to allocate the relative rule-making roles of regional and territorial authorities under s 62(1)(i), no issue of transfer of functions arises under s 33.

Conclusion

[35] It follows that I agree with the conclusion reached at first instance by the Environment Court.

Disposition

[36] The appeal is dismissed.

[37] The Council is entitled to costs. If they cannot be agreed, memoranda may be submitted.

Stephen Kós J

Solicitor:
Cooper Rapley, Palmerston North for Respondent

And to:
Donald Coles, RD2, SH 22, Huntly, Appellant
Federated Farmers of New Zealand, 159 Khyber Pass, Auckland
IN THE MATTER OF THE

Resource Management Act 1991

AND

Resource Consent Application – CRC071029 for the purposes to take and use water from the Waitaki River as Part of the Hunter Downs Irrigation Scheme by The South Canterbury Irrigation Trust & Meridian Energy Limited

Decision of the Hearings Commissioners

Introduction

1. In October 2006 Meridian Energy Limited (MEL) and The South Canterbury Irrigation Trust (SCIT) jointly lodged three applications for resource consent with the Canterbury Regional Council (the Regional Council). These applications sought consent to divert, take, use and discharge water in the Lower Waitaki Catchment for an irrigation known as the Hunter Downs Scheme (HDI). The applications were accompanied by a substantial assessment of environmental effects (AEE).

2. MEL and SCIT (the applicants) made it clear that these applications were the first step in a two stage process which it was hoped would ultimately result in all the necessary consents being granted to enable HDI to proceed. The Resource Management Act 1991 (RMA) does not encourage a staged consenting process. Rather it encourages an applicant to make all the applications for consent necessary for its proposal at the same time. This is intended to enhance the process of integrated environmental decision-making.

3. In this case there are a number of other consents that will be required in addition to those sought in the October 2006 applications. Without trying to be definitive these include consents to carry out land use work in the Lower Waitaki River bed and to discharge structures. Land use consents may also be required for the irrigation reticulation infra structure.

4. As a preliminary matter it was necessary to decide whether the two stage consenting process sought by the applicants would be acceptable to the consent
authority. On 11 December 2006 acting under delegated authority from the Regional Council, Commissioner Skelton conducted an informal hearing to determine this question. For the reasons given in a decision issued on 21 December 2006 the Commissioner approved the two stage process. A copy of Commissioner Skelton’s decision is annexed to this decision as Appendix 1.

5. In accordance with this decision the only application that ultimately came on for hearing later in 2007 was the application to take and use water for the purposes of agricultural and horticultural irrigation. This is application CRC071029.

6. This application was publicly notified in various newspapers (the Timaru Herald, the Otago Daily Times, the Christchurch Press with a shorter version in the Oamaru Herald and the High Country Herald) between 5 and 9 May 2007.

7. In respect of this application 460 submissions were received. There were 42 submissions in support and 27 of these submitters asked to be heard. There were 366 submissions in opposition and 210 of these asked to be heard. There were three submissions that were neither in support or opposition and none sought to be heard. Of the total of 460 submissions 49 submissions were late and of those 20 were granted a waiver. This resulted in 431 valid submissions.

8. On 11 July 2007 Commissioner Skelton conducted a pre-hearing meeting at Oamaru involving the applicants and the submitters in support and in opposition. At this meeting arrangements were discussed and confirmed relating to the conduct of the substantive hearing which commenced at Timaru on 29 October 2007.

9. This hearing took place before a Hearing Panel comprising Commissioner Peter Skelton (Chair) and Commissioners Michael Bowden and Dr Gregory Ryder all appointed by the Regional Council for the purpose of hearing and determining the application for consent pursuant to the relevant provisions of the RMA.

10. The hearing of evidence and submissions from all parties who wished to be heard including the applicants occupied several weeks concluding on 19 December 2007. On that day we (the Panel) adjourned the hearing sine die on 21 days notice in accordance with a procedural statement given orally that day a copy of which is annexed to this decision as Appendix 2.

11. On 4 December 2007 we undertook an extensive site inspection both for the purposes of this case and for the purposes of a case that we had finished
hearing some two months before concerning the North Bank Tunnel Concept (NBTC).

12. More particularly for the purposes of this case we viewed much of the farm land in the HDI command area, the Wainono Lagoon, and the existing irrigation diversion and intake at Stonewall which it is proposed will be extended for the purposes of the HDI. This site inspection together with the more detailed inspection we made of the Lower Waitaki River on the same day gave us a better understanding of the evidence we had already heard and were continuing to hear but of course was not taken by us to be in substitution for that evidence.

13. As stated in Appendix 2 this hearing was adjourned for a lengthy period of time because the subject matter is closely associated with other applications including applications for irrigation water that were then pending and which were later heard at Oamaru between 11 August and 2 October 2008. There was no opposition to this course being followed.

14. Following the hearing of the other applications in 2008 we gave priority to completion of our decision in the NBTC hydro electricity case. That decision was issued at the beginning of December 2008.

15. In March 2009 we began the lengthy and complicated process of determining this application and the other applications heard between August and October 2008 and that process has been ongoing. On 20 April 2009 we resumed the hearing of this application and some of the other applications to which we have just referred at the request of the applicants. The purpose was to hear from the parties about discussions they had been holding with a view to reaching agreement on certain matters to do with flow measurements and flow sharing arrangements at times of low flows in the Lower Waitaki River. The outcomes of this resumed hearing will be referred to in the course of this decision. At the conclusion of this resumed hearing the hearing was again adjourned sine die on 21 days notice in accordance with a Minute issued that day a copy of which is annexed to this decision as Appendix 3.

16. On 2 March 2010 we again resumed the hearing of this application in accordance with a Minute to Parties issued on 11 December 2009 a copy of which is annexed to this decision as Appendix 4. The purpose of this resumed hearing was to hear further evidence and submissions from the relevant parties on the matters raised in that Minute. We will refer to that evidence and submissions at
the appropriate places in this decision. On 3 March 2010 the hearing was again adjourned sine die on 21 days notice.

17. On or about 25 March 2010 we received a Memorandum from Ms Pru Steven counsel for the MRNAG and a group of current irrigators in the Lower Waitaki River raising for the first time the proposition that for the purposes of determining this application we should take into account that there is an application to divert water from the River at the rate of 30 cumeecs that is still on hold in terms of the Minute in Appendix 1. Ms Steven submitted that for the purposes of assessing the allocation requirement for the HDI we should add in the additional 9.5 cumeecs over and above the 20.5 cumeecs applied for in this present application.

18. We directed that this Memorandum was to be sent to the other parties in these proceedings and on or about 26 March 2010 we received a response from Ms Jo Appleyard counsel for the present applicants. We have not heard from any other party but in the light of what we are about to say that is of little moment.

19. Ms Appleyard submitted that we should not consider in any way an application that is not before us. This should be for a future decision-maker to consider. She went on to submit than in any event it is by no means certain that an application to divert water will be required for the HDI and even if it is it may not be the same as the present one that is on hold.

20. We agree with Ms Appleyard for both the reasons she gave that it would be wrong for us to consider an application that is not before us. Accordingly we decline to do so as requested by Ms Steven.

21. On 19 April 2010 we issued a further Minute advising the Parties that this decision was nearing completion and that the hearing was now complete. A copy of that Minute is annexed to this decision as Appendix 5.

22. Finally in this introduction we record that we are very conscious of the length of time it has taken to deliver this decision but we are also very conscious of the fact that it is an important matter for South Canterbury and indeed (we think) for the nation. The outcome of this case also has a significant bearing on many of the other applications referred to earlier and we are grateful to the parties for their forbearance. We trust that in what follows it will be apparent that we have given all the issues raised a thorough examination.
The Proposal

23. Brian Ellwood holds the degrees of MAPpSC (Hons) in agricultural engineering, and post graduate certificate in Irrigation from Charles Sturt University of New South Wales (2007). He is a Water Infrastructure Technical Specialist at Meridian Energy Limited (Meridian) and has the role of Project Manager for the Hunter Downs Irrigation proposal (HDI).

24. Mr Ellwood said that work on developing suitable and feasible irrigation schemes for parts of South Canterbury originated in the 1930s with the construction of the Redcliffs scheme at Stonewall. This intake and a second at Bells pond constructed in the 1970's form the Morven-Glenavy Ikawai Irrigation Scheme (MGI). This scheme draws water into the two intakes, Stonewall and Bells' Pond and then irrigates 22,000 ha of the flat plain between the Lower Waitaki River and the Waihao River. In the 2004/05 season the main supply race of MGI was extended north of the Waihao River to irrigate a further 3,000ha of land.

25. Meridian and its predecessors have had a long association with irrigation in the Waitaki Valley and became involved in the development of irrigation options for the South Canterbury region around 2001 when it began investigating options for irrigating South Canterbury without the use of water from Lake Tekapo. Those studies identified the HDI command area as possibly viable.

26. Mr Elwood believed that securing a reliable water supply is one of the key factors that will determine the viability of HDI. He said that was the reason the application has been made for a minimum flow of 100 cubic metres per second (hereafter referred to as cumeecs). Consultation on that flow regime began prior to the Water Allocation Board (WAB) hearings and continued with Meridian presenting evidence at the WAB hearings for two flow regimes for the Lower Waitaki River, those being either retention of the status quo or a combination of the 110 to 150 cumeecs minimum for the reach Waitaki Dam to Blackpoint and a 100 cumeecs minimum downstream of Blackpoint. In 2005 those flow regimes were presented to irrigators and other stakeholder groups.

27. Mr Elwood also believed that although the irrigation companies presented to the WAB hearing that the status quo (120 cumeecs at the dam and 80 cumeecs at the sea) should remain, there was agreement among them that an appropriately low minimum flow was necessary for reliability of irrigation abstraction. He thought this position was also reflected in many of the submissions on HDI, which
although they were in opposition, supported the 100 cumec minimum flow being promoted by HDI.

28. Mr Ellwood said that the scheme which has the capacity to irrigate 40,000 hectares from within a command area of 60,000 hectares would take water from the Lower Waitaki River at an area called Stonewall. A pump station at that location would be 100m above sea level (ASL) and would lift water 140m to an elevation of 240m ASL and discharge it into a canal which would traverse the Waihao Downs area and proceed northwards along the foot of the Hunter Hills to end just north of the Pareora River in the district called Otipua.

29. The designed pumping height has been selected to make feasible canal excavation in the Lundon’s Gorge area and allow gravity feed to the command area. The HDI, if consented, would be the second or third largest irrigation scheme in New Zealand after the Rangitata Diversion Race Scheme.

30. The proposed take of 20.5 cumecs included 3.06 cumecs applied for by Waihao Downs Irrigation Limited (Waihao Downs). This application will be the subject of a separate decision. Mr Ellwood said that should both the HDI take application and the Waihao Downs take application be granted, and Waihao Downs chooses to build and operate their scheme independently of HDI, then HDI will reduce its maximum rate of take by the amount taken by Waihao Downs.

31. Mr Ellwood said that since 2005 Meridian has been involved in discussions on how hydro electric generation and irrigation interests could operate together in the Catchment now the Waitaki Catchment Water Allocation Regional Plan (the Allocation Plan) is operative. Agreement on the operation of the Waitaki Power Scheme system and the downstream delivery of water is pivotal to the successful implementation of water allocation in the Catchment. No agreement has been reached to date.

32. Meridian had also sought the agreement of the irrigators to establish a single flow banding system with all irrigation abstractions sharing the Allocation Plan’s 90 cumec allocation on a pro-rata basis. The HDI application was made on that basis which simply accords the same priority to new consents as existing consented takes. The alternative water sharing regime is for two separate bands, one for existing consented takes and one for new consents. The first band consents would have first priority to access water and the remaining flow is
available for new users in band two. Within each band consented abstractors share water on a pro-rata basis.

33. Mr Ellwood said that while the applicants had commissioned extensive assessments on the potential effects of the proposed HDI scheme take and the intensification of land use with irrigation many of the effects were not easily quantified, especially those associated with the use of water by irrigation onto land. He said there were a range of land uses that are currently capable of being applied to this region with the use of irrigation. Therefore the applicants and their advisers considered that to give certainty to the Regional Council and submitters a series of management plans were needed.

34. Mr Ellwood said that if the stage 1 consent is granted satisfactorily the HDI project will have a relatively long duration. The long lead time before scheme commissioning, would allow the scheme and the farming community, time to consult, attend workshops, field-days and presentations on the approach taken in the Scheme Management Plan and the Farm Management Plan templates.

35. He said that the Scheme Management Plan and proposed conditions required that the consent holder provide the opportunity for the development of a Community Liaison Group and a Ngai Tahu Liaison Group. With early development of these two liaison groups the community and Ngai Tahu will have the opportunity for early input into the plans, and the plans will be enhanced as a result, as will the development of the physical infrastructure for stage 2.

36. The Scheme Management Plan will also set out the protocols, policies and procedures that HDI will follow in the development, operation and maintenance of the scheme in order to ensure that both the scheme operators and the water users can achieve high environmental standards and sustainable outcomes.

37. Mr Ellwood said that the Scheme Management Plan's objectives would be transferable and enforceable to individual farm properties via a water supply agreement between the HDI water supply company and the individual water user. It was proposed to develop Plan detail in parallel with the engineering detail development, to allow the scheme to take advantage of new technologies. The objective was that all 'on farm' irrigation equipment design would be undertaken by an Irrigation NZ accredited designer and to have measurable performance criteria audited during commissioning. The use of the design code will ensure that factors that influence system performance like soil type, infiltration rate,
water holding capacity and slope are taken into account at the design stage where corrections are easily made.

38. Walter Lewthwaite is an Environmental Engineer with URS (NZ) Ltd (URS). He has specialised in water, soil and environmental engineering since 1989. He holds a BE (Hons) in civil engineering and a post graduate certificate in engineering hydrology from University of New South Wales. He is a Chartered Professional Engineer in New Zealand.

39. Prior to Mr Lewthwaite's involvement in the HDI project there had been a number of studies aimed at integrating water resource planning for irrigation throughout South Canterbury. During those studies URS investigated hydrology, storage opportunities and engineering infrastructure to expand the area irrigated, without diverting water from the MacKenzie Basin in the Upper Waitaki Catchment. For the coastal plains, that were the focus of this hearing, the studies concluded that the best source of supply was the Lower Waitaki River, although a small part of the northern end of the coastal plains could be serviced from the Opihi River at the expense of other land in the Opihi Catchment.

40. Mr Lewthwaite said that in July 2005, Meridian commissioned URS to conduct a further study, building on the earlier reports, to develop an optimum scheme for the coastal plains between the Lower Waitaki River and Timaru. The primary purposes were to consider whether alternative higher level canal delivery systems might be technically feasible and economically viable, and to optimise the primary canal delivery system, including the alignment identified in the Integrated South Canterbury Irrigation (ISCI) Scheme or any new alignments, to enable development of a technically and economically viable irrigation scheme for South Canterbury.

41. He said that the study was mainly a desk-top exercise where they accessed previous reports, topographical and geological maps, and aerial and ground level photographs. In addition they conducted limited site visits. Based on that work the design of a number of alternatives for the main delivery system were completed to pre-feasibility level or better. Also the area of land that could be irrigated was established to enable an assessment of the required flow rate at the intake.

42. Robert Potts is the Regional Manager of the surveying, environmental science and engineering, and resource management consulting firm Duffill Watts & King
Limited and has worked in the area of environmental engineering for over 25 years. He holds a Bachelor of Engineering (Honours) and is a Chartered Professional Engineer.

43. Mr Potts assessed the required maximum intake flow of 20.5 cumecs to irrigate a net area of 40,000 ha based on a requirement of 0.53 litres per second per hectare for most of the scheme area, with lower rates in other areas. This included allowance for race seepage and bywash, and also included the 3.06 cumecs sought for the Waihao Downs area.

44. Mr Potts said that given the size of this scheme, crop variability, soil types and management practices, farms within the scheme command area are unlikely to want peak allocation at the same time. He then said that the scheme's design and control systems are to be designed to manage the fluctuation in water demands within the scheme and the infrastructure was generally designed with the capacity to provide water to satisfy a 1 in 10 year dry month.

45. Mr Potts said that the peak design parameters used for the Timaru area were:

   i. 1:10-year drought event, equivalent to 3.3 mm/day;

   ii. 90% off-farm efficiency (piped and canal). An off-farm efficiency of 90% is a generally accepted appropriate design assumption for this system design, as the water will be lost from the main transfer and distribution canals through leakage, evaporation and management flexibility – ability to provide water on demand to where it is needed, particularly during periods when demand is less than peak;

   iii. 80% on farm efficiency at peak periods for centre pivots with K-line fill in. This efficiency is a combination of distribution efficiency (80 – 90%), evaporative losses, and management efficiency (the decision to irrigate when rainfall may occur). This level of efficiency is considered best practice.

46. He said the calculated requirements are therefore 4.1 mm/d for on-farm demand and 4.6 mm/d for off-farm. On an instantaneous application rate basis, the gross scheme peak demand is 0.53 L/s/ha, or 321 m³/ha/week.

47. Mr Potts estimated that typical irrigation application return periods for the scheme are likely to be in the range of 5 - 14 days. The areas of the scheme which have
soils with a lower PAW (Plant Available Water) and centre pivot application systems will generally have the shortest return periods.

**Seasonal Demand**

48. Mr Potts then described how the gross scheme application had been calculated considering the following:

49. On-farm efficiency variability throughout the season as the high efficiency values above cannot be achieved throughout the entire season when not at peak demand. Management decisions during the season add to the annual demand due to deep percolation losses. With travelling irrigators, the soil moisture across a farm during peak periods will generally vary from about 75% to 25% of field capacity depending on whether the paddock has just been irrigated, or is just about to be irrigated.

50. He then said that it will be a requirement of the scheme that on-farm designs are carried out to the Irrigation New Zealand Code of Practice, with all designers vetted to ensure standards of design are met. This will ensure that optimal system design is achieved for each farm layout and soil type. The system flow rate, irrigator speed, application depth and return period will all be based on the peak requirement.

51. Mr Potts then produced Table 1 showing the variability of the scheme demand over the season.

**Table 1: Seasonal Demand (Reproduced from Mr Potts evidence in chief p.7 para.23)**

<table>
<thead>
<tr>
<th></th>
<th>J</th>
<th>F</th>
<th>M</th>
<th>A</th>
<th>M</th>
<th>S</th>
<th>O</th>
<th>N</th>
<th>D</th>
<th>Tot</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Timaru Area</strong></td>
<td>d</td>
<td>d</td>
<td>a</td>
<td>a</td>
<td>a</td>
<td>a</td>
<td>d</td>
<td>d</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Mean Effective Deficit (mm/month)</strong></td>
<td>8</td>
<td>5</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td>6</td>
<td>7</td>
<td></td>
<td></td>
<td>37</td>
</tr>
<tr>
<td><strong>Gross Scheme Application (mm/month)</strong></td>
<td>1</td>
<td>7</td>
<td>8</td>
<td>1</td>
<td>8</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td>58</td>
</tr>
</tbody>
</table>

a On-farm irrigation efficiency of 70%.

b Off-farm efficiency taken as 85%.

d On-farm efficiency taken as 80%.

e Off-farm efficiency taken as 90%.

52. From Table 1, the average operating days (number of irrigation days at peak demand) for the Timaru area is 127 days, spread over 8 months, i.e. a total season length of 242 days.
53. Allocation Plan Policies 16 (c)(i) and (ii) require the annual volumes to be assessed against the 1 in 5 year dry season or ECAN report U05/15, which is the basis for Schedule WQN9 of the proposed Natural Resources Regional Plan (NRRP).

54. Mr Potts agreed that Schedule WQN9 was intended to provide sufficient water in eight years of ten (equivalent to 1 in 5 year dry year assessment). However, if that allocation block is then also used with the proposed surface water reliability, the combined reliability may be lower. The WQN9 allocation is applied to on-farm takes, generally from groundwater and is thus considered to be 100% reliable, as most groundwater takes do not have low groundwater trigger level restrictions on them.

55. Mr Potts then said that Rule WQN25 of the proposed NRRP is the permitted activity rule for use of water for irrigation. Condition 1(a) requires that irrigation use is within an annual volume calculated as per Schedule WQN9 (revised via Variation 2), but that Rule WQN26 of the proposed NRRP is the discretionary activity rule for use of water for irrigation if the annual volume is in excess of Schedule WQN9. Discretion is open and includes showing efficiency of conveyance and application, the rate and take is a reasonable requirement, and the effects on down gradient drainage and water bodies.

56. Mr Potts assessed the water use using:
   
i. the method reported in ECAN report U05/15; and
   
ii. the calculation provided above in Table 1.

57. Mr Potts made the point that WQN9, arable use is allocated less water than intensive pastoral. The scheme command area covers a mix of soil types and land uses. The Duffill Watts Group (DWG) water requirement assessments have been based on climatic and soil data only and not crop type. Therefore, to be consistent with the DWG soil and climatic assessment above, the WQN9 values shown are for intensive pastoral use only. Also note that WQN9 is an on-farm assessment only, hence off-farm requirements are not included, i.e. the annual application depths in WQN9 need to be increased by 10% - 15% to compare with the H D I scheme.

58. Mr Potts believed that for the majority of the command area the WQN9 allocation assessment would therefore be 440 – 570 mm and the DWG average allocation
assessment is 583 mm (including off-farm losses). He said that the DWG figure reduces to approximately 510 mm/yr without off-farm losses.

59. The WQN9 allocation does not meet the Scheme's water requirements in extreme seasons because the WQN9 assessment is only sufficient for a 1 in 5 year dry season and assumes an on farm efficiency of 80% for the entire season. In addition, as explained above, even with very efficient irrigation systems, it is not possible for 80% of the applied water, in combination with rainfall, to be effectively used in the shoulder season.

60. The annual water allocation being applied for is in the same range as the WQN9 assessment and thus could be considered a reasonable annual use of the water.

61. The appropriateness of the quantity of water applied for as an annual allocation was one of a number of issues raised by us in the Minute issued to all parties on the 11th December 2009 -Appendix 4- and dealt with at the reconvened hearing on the 2nd and 3rd March 2010.

62. At the reconvened hearing Mr. Potts presented recalculated annual volumes using the WQN9 V2 method. He provided two scenarios:

(i) Scenario 1 assumed 100% pastoral activity;

(ii) Scenario 2 used the proportions derived by Mr Ford another witness called by the applicants. His predicted land uses showed arable ranging from 10 -30% within the sub-schemes, with an overall average of 19% for the entire HDI area.

63. Mr. Potts considered that 90% off-farm efficiency was likely to be achievable for HDI, as no operational by-washes are proposed, i.e. losses should only be evaporation and leakage.

<table>
<thead>
<tr>
<th>Table: WQN9 V2 On and Off-Farm Irrigation Annual Volume Requirements.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Based on Lower Rainfall Isohyets</td>
</tr>
<tr>
<td>----------------------------------</td>
</tr>
<tr>
<td>100% Mr. Ford's Pastoral</td>
</tr>
<tr>
<td>Combination</td>
</tr>
<tr>
<td>On-Farm Annual Requirement</td>
</tr>
<tr>
<td>Requirement</td>
</tr>
</tbody>
</table>

12
64. Mr Potts said the following inferences could be drawn from the Table:

i. Assuming 100% pastoral agriculture, the annual on-farm irrigation requirements range from 514 mm to 563 mm depending on the effective rainfall.

ii. The scenario based on Mr Ford's land use distribution gives values ranging from 491 mm to 540 mm.

65. Mr Potts agreed that WQN9 V2 indicated the annual volume for the on-farm annual requirements would be in the order of 206 to 225 million cubic metres based on 100% pastoral agriculture or 197 to 216 million cubic metres based on Mr Ford's derived land use combinations. When taking off-farm efficiency into account (90%), the land use combination predicted by Mr Ford required 216 to 240 million cubic metres, whereas intensive pastoral requirements are 228 to 250 million cubic metres.

66. Mr Potts said that unlike individual applications, there is no indication of what the final land uses across the scheme may be. These would be dictated by commodity prices to some extent and may vary from time to time. A conservative approach from a scheme point of view is to allow for the most conservative case, i.e. intensive pastoral of 228 - 250 million (average of 239.3 M m³) using WQN9 V2.

67. He said that he based the annual volume of 251 million cubic metres on a 1 in 10 year application depth of 627 mm, which was based on a very high proportion (90%) of rainfall being effective in a 1 in 10 year event.

68. Mr Potts said that although he used a different methodology from WQN9 V2 he ended up with a result that is 1 mm different for the intensive pastoral scenario and lower rainfall zone (627 vs. 626 mm/year). It was Mr Potts' view that, the method he used met Policy 16 (a) but not Policy 16 (c) in the Allocation Plan. He
added that apart from WQN9 V2 none of the methods currently used by consultants meet Policy 16 (c) as they do not involve soil moisture measurement, only modelling of a soil water balance.

69. He considered that the WQN9 v2 allocation would likely result in an inconsistent allocation based on what is already granted and recently granted in the area. The applicants had requested 251 Mm$^3$/year and he still regarded this as a reasonable and efficient use of water, particularly as it also includes off-farm conveyance, is based on a very high proportion of the rainfall being effective and is not too dissimilar to the higher end of the WQN9 V2 method value.

70. We accept that the difference between the annual allocation volume calculated by Mr Potts and the volume he derived using WQN9 V2 is not great and that the future land uses within the scheme area is uncertain. However reticulation losses represent 10% of the water abstracted for the scheme. Therefore it will be incumbent upon the applicant to ensure that the design of the reticulation system is such that losses are minimized. On that basis we consider that an annual allocation limit of 251 million cubic meters would be appropriate.

71. Returning to the details of the Scheme, Mr Lewthwaite said that once the decision was taken to seek a staged consent further engineering planning concentrated on the intake works and the preparation of further concept plans together with descriptions of construction activities that provided confidence that the scheme was a practical possibility.

72. Earlier studies had concluded there was enough water within the Opihi and Opuha catchments to expand considerably the area currently irrigated, with a high reliability of supply. To achieve that expansion would however require the construction of significant storage facilities. However there is not enough water to extend irrigation to a significant area of land outside those two catchments.

73. Mr Lewthwaite said that studies by Glasson Potts Fowler had concluded there were insufficient groundwater resources or water in coastal streams and rivers within the HDI command area to reliably irrigate much land. Accordingly it was concluded that the only feasible source of water for the HDI area was the Lower Waiatai River.

74. A 2005/06 URS study identified five concepts with a total of 19 options for supplying water to the HDI command area. Of those options, MEL and SCIT
selected the Stonewall pump station intake option, and further, selected the highest feasible level gravity canal because that would maximise the command area. That option is the subject of this application and had been the main focus of discussion with stakeholders.

75. Mr Lewthwaite said that a key conclusion of that option was that the maximum size scheme would be feasible technically, irrigating up to about 40,000 ha in a total land area of about 60,000 ha. It was also likely to be feasible financially, in that it would supply farms at a similar cost per hectare to schemes previously investigated for the area and to other modern irrigation schemes in Canterbury and North Otago.

76. In May 2007 Mr Lewthwaite participated in an engineering risk workshop which identified two main topics for further study, to be carried out at the time of a full feasibility report. These were fish screens and geotechnical investigations for the main headrace canal however the workshop identified no fatal flaws to the scheme as proposed.

77. Mr Lewthwaite explained that Stage 1 phase was limited to the present application to take and use water, Stage 2 works could consist broadly of the following works:

- Diversion works, with low level gravel weirs to turn water from the natural river braids into the scheme, excavated diversion race to run water from the natural river braids towards the scheme intake, lateral gravel-and-rock weir as an overflow spillway in the diversion race that will discharge excess flows back into the river rather than endangering the scheme intake works, and intake pond with its own overflow spillway that will provide a constant water level to enable accurate control of the amount of water entering the intake structures.

- Intake facilities, with flow control structure to accurately meter the flows entering the scheme, canals, fish screen to exclude fish from the scheme, fish return race to return fish from the screen back into the river, pump station forebay, control structure to replace the existing upper MG115 intake, and emergency overflow spillway to provide further regulation of flows.

- Pump station with associated hard-standing area for storage of equipment, repair area and parking vehicles, vehicle access, switchyard and rising main.
- Open gravity headrace canal leading from the end of the pump station rising main and sidling around the Waihao River valley, through Lundons Gorge near Walmate (this could be via a deep cut, or tunnel, or further pump station), then along the top of the coastal plain, and terminating at the Pareora River.

- Control structures and turnout facilities in the headrace canal.

- Secondary distribution works to deliver water from the headrace canal to individual farms.

- Water control systems to monitor and regulate flows in the headrace and secondary distribution works, and

- Bywash and emergency discharge facilities at selected points along the headrace canal and in the secondary distribution system.

78. Mr Lewthwaite said that within the general area of the selected intake site (i.e. Stonewall) there are options for locating the main diversion channels. Suitable sites occur over about a 2 km length of the riverbed. The downstream end of this range is preferred by ecologists as it minimises impacts on sensitive ecological areas in the vegetated river berms. It also reduces the length of river affected by the proposed works. This would enable concerns such as those expressed by the Royal Forest and Bird Protection Society about potential damage to wetlands to be addressed.

79. Mr Potts investigated alternative sources of water for the scheme and said that he had considered other sources of water prior to proposing the option selected for the HDI. He explained that the total currently consented take rate within the scheme area (surface and groundwater) is 412,924 m$^3$/day with the majority of that water (69%) sourced from groundwater.

80. Mr Potts said that the consented daily abstraction rates for groundwater takes within the groundwater allocation zones of the Pareora to Waihao Downs totals approximately 291,233 m$^3$/day. The Pareora, Makikihi, and Hook groundwater zones are considered to be over-allocated or at the allocation limit.

81. In his view based on the current estimate of the available groundwater resource, there was unlikely to be enough water from within the scheme area to satisfy the requirements of irrigated farming practices such as those observed in other irrigated districts.
82. He said that the majority of the shallow wells in the scheme area have high connectivity with adjacent streams and rivers but have not been classified as surface water takes and there was little or no reported information on deep aquifers within these groundwater zones.

83. Mr Potts said that groundwater was not considered to be of sufficient quantity and reliability to be economically viable as a major resource for irrigation development in this area.

84. He said that surface water takes and hydraulically connected groundwater takes within the surface water catchments account for a total of 3.4 cumecs (or 283,760 m³/day), with nearly all of the catchments exhibiting greater allocation than their 7 day mean annual low flow (MALF70). This suggested to him that within most of the catchments, the surface water resources are under considerable pressure, and minimum flow restrictions are likely to be in place during the summer months.

85. John Waugh holds a Master of Arts degree in Geography and Earth Sciences (1962) and completed a Certificate in Engineering Hydrology at the University of NSW (Sydney) in 1972. He had worked as an hydrologist for over 40 years. He gave evidence as a private submitter.

86. Mr Waugh also commented on the distribution of surface water resources of Mid and South Canterbury (733 cumecs mean flow between the Rakaia River and the Lower Waitaki River) saying that the resources were dominated by the large alpine-headwater rivers.

87. Based on mean flow, the three large alpine-headwater rivers (Rakaia, Rangitata and Waitaki) contributed 89.5% of the total surface water resource. In contrast, the smaller "foothills" rivers contributed only 10.4%.

88. Based on low flow, the contribution of the three alpine-headwater rivers, Rakaia, Rangitata and Waitaki (MALFs totalling 287 cumecs), is even more dominant at 96% of the low flow surface water resource. Whereas the seven small foothills rivers only contribute 4%.

89. His view was that these small rivers bear a disproportionate share of the allocated water use. Rivers like the Opihi and Ashburton are among the most heavily utilised rivers in New Zealand. In the 1982 drought the Opihi River ceased to flow between Butlers Road (Level Plains Irrigation Scheme Intake) and State Highway One.
90. Mr Waugh said that even with no abstractions, all the foothill rivers in the command area go dry in their middle to lower reaches as flow is lost into unconsolidated gravels. Some of this water resurfaces before the rivers reach the coast e.g. Lower Pareora River, and some of the water sustains nearby lowland spring-fed streams like Buchanans Creek and Sir Charles Creek.

91. Mr Waugh presented a summary of the flows in the HDI command area based on Canterbury Regional Council's (2006) Water Resources Summary estimates. It showed that the total mean flow of the foothill rivers in the command area was 9.911 cumeecs. This he said was in stark contrast to the 733 cumeecs available at mean flow for all the rivers between the Rakaia River and the Lower Waitaki River.

92. During low flows conditions the total surface flow in the scheme area is only 1.485 cumeecs (0.5%), of the total of 299 cumeecs between the Rakaia and the Lower Waitaki Rivers.

93. In Mr Waugh's opinion the HDI command area is one of the driest, most water-short areas in New Zealand. Groundwater in the scheme area is patchy and highly variable. Water use data for the Waihao River catchment (E Can, 2005) serves to highlight the water availability issue. For the 33 year period 1973 - 2005, over the whole Waihao River Catchment, the consented surface water takes increased from zero to 2661/s and permitted groundwater takes increased from 2 to 45 1/s.

94. For Mr Waugh bringing a reliable supply of irrigation water into the HDI Scheme area was the only possible way of providing adequate water for irrigation purposes. The local water resources, even if subject to impoundment and storage, were simply inadequate.

95. Mr Potts confirmed that a storage dam on the Waihao River was considered by Opus (2000) prior to feasibility design of the Waihao North Scheme but it was considered that the catchment lacked reliable rainfall to make a dam scheme viable.

96. He also added that in addition to the water bodies for taking of water in the study area, there are two other water bodies within the locality that had been considered as possible water sources:

- Wainono Lagoon

Use of the Lagoon as an irrigation resource was constrained by the fact that the Lagoon is considered to be a wetland of national importance, and is of special significance to local Maori.
Lake Tekapo

This resource had been investigated a number of times in the past. The most recent proposal was by Aoraki Water Trust (AWT) to take 15 cumecs through Burkes Pass, with some of the water coming into the northern part of the HDI command area - the Pareora, Otipua and Otaio areas. The AWT proposal would have serviced approximately only 10,000 ha of the proposed 40,000 ha of the HDI area.

97. Mr Potts said that there was 470m of available generation head between Lake Tekapo and the Waitaki Dam. Furthermore, if the proposed NBTC was successful in gaining consent and was built, there would be an additional 125 metres of head between Waitaki Dam and Stonewall. In terms of the cost of lost generation, the 140 m lift for the HDI is more economically practical than losing possibly 595 m of generation head.

98. A submission from Dave Irwin, (who did not give evidence at our hearings) for students enrolled at CPIT, expressed a concern about safety for river recreators in relation to the intake works. Mr Lewthwaite explained that details of those structures will be developed in consultation with key river users during the design phase of the later Stage 2 applications, if the scheme proceeds.

99. A submission from the Regional Engineer of the Canterbury Regional Council expressed concerns relating to the effects of the proposed intake on flood levels, diversion of flood flows, and the threat of erosion or changes in the course of the river, and liabilities for consequential damage or for repair to river works or scheme works. Specifically there were concerns about:

- The number of diversions needed from the river, (The Regional Council considers a single intake might be less likely to lead to excessive flows in the diversion, and therefore less likely to cause damage).

- The nature of the overflow spillway in the river, (The Regional Council would prefer a weir that would breach readily in flood events, as this would be less likely to lead to a change in the course of the river).

- Disposal of excavated sediments, relating to construction, operation and maintenance phases of the intake works.

- Liabilities for maintenance and repair of both HDI scheme works and other river works, and for any consequential damage resulting from the scheme works.
100. Mr Lewthwaite acknowledged that the Regional Council's concerns are reasonable concerns that need to be addressed but they are not part of the present Stage 1 application. In his opinion there were practical solutions readily available and for Stage 2 they would be addressed to ensure there were clear, practical and cost effective solutions that were developed in consultation with relevant stakeholders. He also made the point that because of its investment the scheme will have a strong vested interest in devising practical, secure and cost effective solutions.

101. Mr Lewthwaite said that about 30 cumecs of water would need to be diverted from a flowing braid of the Lower Waitaki River into a diversion race. From the diversion race it is proposed to take a maximum rate of flow of 20.5 cumecs for HDI. This take was to occur in conjunction with and in addition to the maximum take allowable for the existing MGIIS at the Stonewall site, that being 6 cumecs. The proposed HDI intake facility would also convey water to the upper MGIIS intake. The MGIIS intake currently has no fish screen but at the time of implementing HDI a new intake gate would be provided, including a fish screen. We comment here that this was Mr Lewthwaite's evidence at the original hearing of this application and in the light of our ruling about diversion in the Introductory section of this decision should be regarded as nothing more than a recording of what he said at that time.

102. The Royal Forest and Bird Protection Society was concerned that the applicants would have "limited ability to control the amount of water abstracted". The Lower Waitaki River Management Society (Inc) raised a similar concern, stating "... the practicalities of strict compliance to accommodate day to day changes in flow, given the huge pumping duty and extensive canal system, would appear to be impractical".

103. Mr Lewthwaite said that the scheme will be set up with a series of features to enable precise control of the water taken. There will be an overflow spillway on the diversion race, intake pond with outlet weir, flow control structure, pump station forebay with overflow spillway, pump station with multiple pumps with variable speed drives, flow meters after each pump and a monitoring station in the channel downstream.

104. A fish screen is proposed to prevent entry of fish into the intake system and there will be a bypass for fish to return to the Lower Waitaki River. Submissions from the Otago Fish and Game Council and the Central South Island Fish and
Game Council expressed concerns about fish screening. Both submissions state “There is a lack of certainty and standards of protection to be achieved regarding fish screening.

105. Guidelines for best practice for fish screens on intakes on Canterbury Rivers are being developed by a Working Group chaired by Canterbury Regional Council. The group's conclusions will provide valuable input to the design of HDI fish screening. Using such information Mr Lewthwaite considered it feasible to build a screening system to meet the concerns of the submitters.

106. He anticipated that suitably qualified experts would undertake an assessment of the effects that any proposed intake might have on fish species and would develop recommendations on the functional requirements for fish exclusion. It was expected this would ultimately lead to site specific solutions for fish screens or barriers for HDI. This issue was further addressed by fisheries scientists.

Canal/Headrace alignment and irrigation by-wash

107. As part of the optimisation study of 2005 conceptual designs were developed for the main scheme supply headrace. Mr Lewthwaite was aware that there are some environmentally sensitive areas in the vicinity of the likely canal route. He believed the canal can be located to avoid these, and details of design and construction would be developed with the assistance of relevant stakeholders such as Ngai Tahu and the Department of Conservation.

108. The potential for adverse effects on culturally significant sites had been raised by Te Runanga o Ngai Tahu, however Mr Lewthwaite believed that the location of the headrace was sufficiently flexible to avoid culturally sensitive locations. He said that in places the headrace will be piped to siphon under streams, to cross valleys and gullies and to minimise earthworks volumes on steeper sloping areas. He believed that the combination of canal and pipe maintained options for locating infrastructure to avoid sensitive areas.

109. The main headrace canal would use automated control gates and the applicants would investigate the use of buffer storage reservoirs to reduce flow fluctuations. This would allow an on-demand irrigation supply.

110. Mr Lewthwaite said that the conceptual proposal is for the headrace to be an open canal. An open canal would be cheaper than a piped headrace, by a large
margin. Regarding seepage, he said that with a well-engineered canal that was lined with soils that have an adequate proportion of fine material, water losses can be minimal.

111. The issue of energy efficiency was raised by Te Runanga o Ngai Tahu in the context of possibly supplying water through pipes to farms at a positive pressure. However it was intended that the headrace would be built on a flat gradient, about 0.02% or a fall of 1 m in 5,000 m. Mr Lewithwaite said that for the large flows proposed it was not practical to build a pipeline on that gradient. Therefore an open headrace would run at a higher level and would have the opportunity to supply water to farms at a greater pressure than would a piped headrace. A piped headrace offered no gain in energy efficiency.

112. Mr Lewithwaite said that no decisions have been made on the form of the secondary supply network, but it could be a combination of open channels and pipes. He said that it was recognised that these conceptual design features were based on limited field data and almost no consultation, and that considerable optimisation would be done as the scheme progresses towards Stage 2 consents, final design and construction, should consent be granted for Stage 1. However he was confident that the headrace was buildable along the lines he had described.

113. For economic, cultural and environmental reasons the applicants wish to reduce bywash to a minimum. Historically experience had shown that in an open channel reticulation system it was possible to reduce normal operational bywash to 10% of intake flow, or less, by careful control of intake systems and integration with farmers’ irrigation requirements. The trend now is towards zero operational bywash, and that is the aim for HDI. Mr Lewithwaite considered this was achievable.

114. The second area of concern with by-washes related to discharges from secondary distributors that feed off the main scheme headrace and deliver water to each property. At this stage of scheme development no details had been proposed for the engineering of these distributors. However the network could consist of either open races that run down from the headrace canal, or piped supplies, or a mixture of both. Either way, by-washes can be reduced to minimal levels or eliminated altogether by devices as for the headrace, scaled appropriately. Where by-washes might occur they would be designed to discharge via constructed wetlands that would return the water through land to
adjacent streams. The location and specific design of these wetlands would be addressed during the Stage 2 design process. Controls could be integrated with the main headrace SCADA system.

115. The submission from Te Runanga o Ngai Tahu raised a concern about mixing waters between catchments. Mr Lewthwaite said that it was acknowledged that the scheme proposed to take water from the Lower Waitaki River and run it north towards Timaru, and that it will at times discharge into other catchments.

116. He said it was intended to aim for zero bywash from the headrace in normal operation, and he considered it was practical to achieve that.

117. He added that small by-wash flows are likely to occur occasionally when the rate of flow in the scheme is reduced significantly, such as at the end of an irrigation season, and these by-wash flows will be discharged via engineered wetlands. The wetlands will be designed to discharge through soil, so while the flows might eventually reach natural streams and gullies they will effectively be a discharge to land, not water. Te Runanga o Ngai Tahu would be consulted in the detailed design process. It would however be necessary to allow for higher rates of discharge in rare peak flow conditions. While every effort could be made to avoid discharging directly to water, by having additional constructed wetlands, it is difficult at this stage to guarantee there would be no discharge direct to water. However these peak flow situations would be rare, perhaps never occurring to the full design capacity in the life of the scheme, and they would be brief, lasting only a few hours.

118. The Royal Forest and Bird Protection Society and Te Runanga o Ngai Tahu expressed concern about the impact of noise and dust during construction. Mr Lewthwaite said that it can be expected that these topics would be addressed by appropriate management plans, as is normal for engineering construction activities.

119. The Lower Waitaki River Management Society (Inc) suggested the use of off-farm or on-farm storage to adjust the water demand, and consequentially reduce primary pumping capacity and canal capacity.

120. Mr Lewthwaite was confident that the HDI was technically viable to construct, operate and maintain. He was adamant that it could be engineered if necessary
to eliminate bywash in normal circumstances and reduce it substantially if necessary in peak flow conditions.

121. Economic analyses concluded that capital expenditure and ongoing operation, maintenance and renewal costs were similar to current levels of investments into irrigation in other parts of Canterbury. He considered that the Scheme was flexible enough in design detail and delivery path to avoid areas which are environmentally sensitive at both the intake area and along the canal route. He also considered that Stage 2 of the project would be able to address the concerns of submitters through consultative design, and through the development of construction and operation management plans.

The Relevant Statutory Instruments

122. The principal statutory instruments that are relevant to the present application are the Waikato Catchment Water Allocation Regional Plan (the Allocation Plan) and various Chapters of the proposed Natural Resources Regional Plan for Canterbury (NRRP) and in particular Chapters 4 and 5 relating to water quality and water quantity.

123. The New Zealand Coastal Policy Statement and the Canterbury Regional Policy Statement also have some relevance particularly as regards the Wainono Lagoon, the Lower Waitaki River mouth area and the Waihoa River mouth area.

124. There are also some Iwi Policy documents that were referred to particularly by Ms Sarah Dawson the applicants’ planning consultant in her evidence and we note here that it was her opinion that the great majority of the policies contained in all these other statutory and Iwi instruments are also addressed directly in the Allocation Plan and the proposed NRRP. We agree with her. Consequently in our consideration of the planning and environmental issues raised in this case we will be concentrating on the relevant provisions of those instruments but this does not mean that we have ignored or overlooked the other instruments.

125. We also note that in terms of the Canterbury Transitional Regional Plan consent is still required for this take and use as a discretionary activity. This Plan while still operative in terms of the RMA is nevertheless now largely redundant by reason of the operative Allocation Plan and if we decide to grant consent in terms of this latter Plan it will follow that consent should also be granted in terms of the Transitional Plan.
126. As we proceed through our decision and our consideration of the issues raised by this application, reference will be made (where appropriate) to the relevant provisions of the statutory instruments.

DISCUSSION AND CONSIDERATION OF FACTUAL ISSUES

The Benefits of Irrigation in the HDI Command Area

127. Stewart Ford is an agricultural consultant with experience in this area. He told us that in 2004 the Ministry of Agriculture and Fisheries estimated that the agricultural contribution to New Zealand’s gross domestic product at the farm gate was some $920 million per annum, or 11 percent of a total of $8.1 billion. By 2013 it is estimated that between $330 and $680 million additional will be derived from irrigation, that is, additional value, at the farm gate.

128. In July 2000, OPUS carried out a climatology modelling exercise as part of the then North Wairau Irrigation Scheme, a pre-feasibility study. We have referred to this earlier in our discussion of the HDI scheme. This study identified that the Waimate District over a period from 1972 to 1999 had a theoretical irrigation season (the period when moisture deficits occurred) of an average of 135 days with a minimum season of 75 days and a maximum season of 175 days. These deficit days occurred in the months of October to April.

129. This study indicates that drought, which is measured by deficit days, is a regular occurrence in the proposed HDI command area and that regular and prolonged droughts are a natural climatic feature in this area. The constant threat of drought has a significant impact on the business profitability of dry land farming in the HDI command area and at times a significant negative impact on farm business viability. It has long been recognised as a significant impediment to further development of the Waimate area as an agricultural economy.

130. Mr Ford then went on to address the issue about reliability of water (which is covered elsewhere in this decision) and he concluded that access to a plentiful supply of reliable irrigation water from the Lower Waltaki River is an essential ingredient in unlocking land use diversification and intensification in the HDI command area.

131. We now summarise the evidence of several farming and related activity witnesses most of whom were submitters in support and who gave evidence about the benefits of irrigation in the HDI command area.
132. Mr John Gregan has a Bachelor of Agricultural Science and is a third generation sheep farmer at the foot of the Hunter Hills. He and his wife farm 700 hectares currently carrying 7,300 breeding ewes and 250 head of cattle. With the HDI, scheme 170 hectares of his farm could be irrigated. The remaining 330 hectares is above the command area. Mr Gregan told us that he is already in the process of converting the 170 hectares to a dairy unit.

133. Currently his average January growth rate is about 40 kilograms of dry matter per hectare and it has varied from five kilograms to 80 kilograms within the last six years. This is very costly to manage. In the summer months, the soil moisture — or lack of it — is the biggest limitation to growth rates. Under irrigation, he expects growth rates would vary 10 percent in the summer months when soil temperature has a larger impact on growth. This sheep and beef farm has both heavy clay and lighter soils, which are managed, but dry summers and wet winters can often mean it is difficult to grow feed in areas where cattle are best fed in winter. Having irrigation will provide him with more options.

134. In answer to a question from Commissioner Skelton, Mr Gregan said that he has not been converting the 170 hectares to a dairy unit in anticipation of the HDI Scheme. He is undertaking this exercise as a dry land unit and he will probably carry 400 cows and winter them on another farm.

135. Mr Derek Marr is a farmer and a potential participant in the HDI Scheme. He has farmed at Horseshoe Bend Road, Otaio, since 1993 in partnership with his wife. Currently this is a dry land sheep farm. Mr Marr has also farmed in Southland and originally in Methven. He has 240 hectares of dry land at Otaio and to minimise the effects of drought he uses direct drilling techniques and has developed a sheep breed that allows for a production curve, also changing his forage system and earlier lambing. Spring is the time for more reliable forage than autumn. He went on to say that he is carrying considerable risk and significantly reduced production.

136. Mr Marr also cited some statistics from the Winchmore Basin in mid-Canterbury which show on average 45 days a year agricultural drought, the soil moisture in the top 10 percent below wilting. He went on to say that in the HDI command area, the contour of the land is almost all rolling country and in some places the tops of the ridges had clay within two centimetres of the surface and there is half a metre of deep soil in the bottom of the gullies. One can also
experience erosion caused by heavy rainfall as well as by wind and this happens in a dry climate.

137. With irrigation, these problems are significantly reduced or, indeed eliminated, especially with direct drilling for minimum tillage and he cited the example of the Canterbury plains, which since irrigation, have not been nearly as badly affected by the strong nor' west winds. He also asserted that irrigation improves soil quality and greatly enhances the nutrient cycle.

138. Mr Jeremy Boys is the chief executive officer of Prime Port, Timaru. He told us that the port derives almost all its revenue from the agricultural sector in terms of both exports and imports. Prime Port is the principal port serving the area from North Otago through to mid-Canterbury. Mr Boys asserted that the HDI scheme is the last real opportunity to harness a fair allocation of "local" water for irrigation. The word "local" is italicised because most of the HDI area is outside the Waitaki Catchment and we will be addressing this matter later in this decision.

139. Mr Boys asserted that with irrigation, farm gate revenue will increase by 2.4 times and he cited as an example the benefits that it is said have been obtained from the Opuha Dam in South Canterbury. He went on to say that this increase in revenue could be five times the current revenue if dairying is taken up as the preferred option. After the farm gate, value is added many times over through transport, processing, storage, packing, transport to wharf, handling and ship loading.

140. 40,000 hectares of irrigated land has the potential to create not only farming growth but huge downstream economic value for the whole community. He concluded by saying that Prime Port supports economic development which is environmentally sustainable.

141. Mr Alister Mudgeley is a third generation South Canterbury farmer at Springbrook, which is on the south side of the Pareora River. Currently, he and his wife farm 247 hectares of rolling downs and river flats and a large percentage of this land has been irrigated for the last 37 years. He said that irrigation has given him flexibility to be involved with many niche markets such as vegetables, small seed production and grain cropping. In recent years there has been an increasing emphasis on stud beef cattle and stud deer and he explained to us that the Pareora River water resource is under stress. Presently it is used by Timaru City, PPCS meat processing plant, 46 farmers, other domestic and stock
water supplies, including Pareora and St Andrew's townships and the 46 farmers are irrigating some 3,400 hectares. There is a wide range of activities, including vegetables, maize, black currants, grains, sheep and beef, deer, dairying and processing of meat.

142. In recent years, deep bores have been drilled 60-200 metres but only with moderate success. A dam site has been investigated in the Pareora Catchment but the local geology is not satisfactory. An attempt was made through the Aoraki Trust to obtain water from Lake Tekapo but this was not successful.

143. Mr Midgeley echoed the sentiments of other farmer witnesses when he told us that drought creates mental stress and hardship. One is driven to killing capital stock and starving the survivors. He asserted that Australians, who have been without appreciable rain for four years now, would think we are insane to allow 350 cumecs of beautiful, fresh, alpine water to flow into the ocean.

144. We comment here that this statement by Mr Midgeley appears typical of a view that the farming community in this area appears to have that the flows in the Lower Waitaki River are running to waste. But, of course, that is not the case as the evidence about in-stream values referred to later in this decision, makes clear.

145. Mr Midgeley went on to address the proposal to have a minimum flow in the Lower Waitaki River of 100 cumecs. Here he was giving evidence as a trout and salmon fisherman and also a duck and geese hunter of longstanding. He said that a 100 cumecs flow is, in his opinion, still a big river and offers far more pools and riffles for fishing on foot, than when the river is running at over 300 cumecs, which it still is and still will be for most of the time. Mr Midgeley has fished for salmon in Alaska and he said the best spawning streams on the Alaskan Peninsula are seldom carrying more than 50 cumecs. He said the water is clear and fish are easy to catch. This needs to be contrasted with some other salmon fishermen who have told us that clear water is not satisfactory for salmon fishing because it spooks the fish.

146. Mr Midgeley also asserted that from a jet boating point of view, 100 cumecs is more than enough but, again, there are views to the contrary.

147. In answer to a question from Commissioner Ryder, Mr Midgeley said that his existing irrigation comes from an underground gallery adjacent to the Pareora River. In answer to a question from Commissioner Bowden, he said that he is
using spray irrigation and k-lines and he gets huge benefit on his clay country.
Commissioner Skelton asked Mr Midgeley if he would be prepared to surrender
his current irrigation permit if he were to join the HDI Scheme and he said that he
would be reluctant to do so. He said that he considered he could co-exist with the
HDI Scheme in receiving water to complement his present water supply. He also
told us that all the coastal rivers in this region are undergoing a review by the
Regional Council.

148. Mr Midgeley’s existing consent runs until 2030. It is for 60 litres per second
and, 4,850 cumecs per day. It costs him $230 per day for electricity and his rate
of application is 25 millimetres. He starts irrigating in early September and
sometimes he runs right through until May. He does not know what his annual
volume is. He is not so limited but, of course, he has a daily volume. He said that
an additional 60 litres per second, (which presumably he would be seeking from
the HDI scheme) would increase his production dramatically.

149. Commissioner Skelton also asked Mr Midgeley about salmon fishing and he
said that he disagreed with those who say that 200 cumecs is the ideal flow for
salmon fishing. On the matter of clear water he simply said that some say water
should be discoloured but others say that is not so.

150. Mr Gary Johnston gave evidence on his own behalf and also as a member of
the St Andrew’s branch of Federated Farmers. He farms at St Andrew’s in the
Otaio catchment. His farm comprises 270 hectares of river silt bordering both
sides of the Otaio River. He took over this farm in 1984 and developed surface
water irrigation using pipes and an irrigation gun. The water ran out in the 1988-
89 season. He then sought water through a deep well but this created many
complications, including striking sand at 100 metres. The well produces 70 litres
a second but the sand is a problem. It has already burnt out one pump.
 Nonetheless, he has expanded his irrigation to two centre pivots, two hard hose
units and two soft hose units and he is watering 160 hectares of intensive crops,
borage, grain seeds, coriander, and other crops. He has also developed an
intensive beef grazing system.

151. Mr Johnston supports the HDI scheme wholeheartedly because it provides,
in his view, a guaranteed source of water. Being able to irrigate in this area will
also have benefits for his neighbours who do not have water at present and it will
also benefit the Otaio community because, at present, children are bussed to St
Andrew’s as the school at Otaio diminishes with closure. He said that the Otaio
catchment has been "on hold" mode for some years regarding surface water, as summer dry is a regular occurrence. A deep aquifer even if pending consents are granted will now be in a red zone and subject to review. The Otaio and Pareora alluvial river valley plains are reasonably well covered by irrigation enhancement but the large area of rolling downlands has no chance of irrigation enhancement from the current sources of water. He went on to say that diversification is seriously limited without water and because the climate is said to be getting drier on the east coast, there are concerns for the future.

152. In answer to a question from Commissioner Skelton, Mr Johnston said that he has current resource consent until 2037 and could not say what the annual volume was. He would be interested in going into the HDI Scheme for additional land currently not irrigated but there would have to be an increase in production to justify going into that scheme. He would want to hold on to his existing consents, although he realises there are problems with the existing water resources, particularly with regard to the so-called red zones. These water resources, he confirmed, are governed by the relevant provisions of the proposed NRRP.

153. Mr David Henshaw is the chair of the Aoraki Water Trust and Pareora-Otaio Irrigation Ltd. He is also a member of the Hunter Downs Steering Committee. He farms the property called Holme Station, which is a partially irrigated, mixed livestock, breeding and finishing farm.

154. Mr Henshaw strongly supported the 100 cumec cut off flow condition. He asserted that this is essential to ensure the required level of reliability for irrigation in the HDI command area. He pointed out that if farmers think they are going to be restricted or are entering a time of potential restrictions on the amount of water they can take they will saturate the ground to mitigate for the anticipated water shortage. This is not a good practice because it increases the potential for run-off. Mr Henshaw also said that if soil moisture levels become seriously depleted, particularly in summer, it takes considerably more water to restore production because soil becomes hardened and less pervious, hence more water is required to get down to the roots and again there is a risk of run-off.

155. We comment here that flood irrigating may well become an undesirable practice from the irrigators' point of view if they were to be restricted to an annual volume based on the efficient use of water as provided for in the Allocation Plan.
It appears from the evidence we heard that in this area that has not been the case up to now.

156. This witness, who has been an irrigator in South Canterbury for many years, says it is essential that all irrigation schemes provide sufficient reliability to ensure that pasture and crops are never allowed to reach wilting point. He understood that the 100 cumecs cut off flow would mean there would never be full restrictions, i.e. irrigation would not have to stop altogether. If reliability is not sufficiently high the economic loss from interrupted growth and production along with pasture renovation, could easily render the scheme uneconomic. This witness also provided a history of the Aoraki Water Trust and said that HDI would partially meet the objective of that Trust.

157. This witness also supported the evidence of Claire Mulcock, another witness called by the applicants, who gave detailed evidence about the scheme and farm management plans.

158. In answer to a question from Commissioner Skelton this witness told us that there is no agreement with MEL that the Aoraki Water Trust will not try to secure water from Lake Tekapo in 2025.

159. Another witness who supported HDI is Mr Greg Skelton, the chief executive officer of Alpine Energy Ltd, which is a lines company. Mr Skelton is an electrical engineer. He told us that Alpine Energy has 30,000 customers in the South Canterbury region. It was involved in the Opuha Dam development. Alpine Energy has a strong correlation with irrigation schemes. The proximity of transmission systems to pumping stations is an efficiency factor and also, therefore, the irrigation of 40,000 hectares in the HDI command area means more efficient use of this company’s existing network.

160. Mr Ross Rathgen gave evidence on behalf of the Otaio River Liaison Committee. He is also a member of the South Canterbury Irrigation Trust (SCIT) and HDI Committee. Presently, he farms beside the Otaio River on the south side approximately seven kilometres upstream from State Highway 1. He started with 90 hectares and then added 310 hectares with his parents and his brother. He now has 200 hectares and has increased his holding to 800 hectares. He also has a seed dressing business and he is involved in a wind power business and contract crop growing on 300 hectares.
161. Mr Rathgen said that he is in a water short area where all existing water zones are 100 percent allocated and there has not been much success in drilling for groundwater. He gave details of the way in which additional irrigation water would be useful to his farming setup and he said it also helped with fertiliser infiltration into the soil on hilly country, so that there is less fertiliser run off. He concluded by saying that his present farming practices would meet the requirements of the HDI scheme management and farm management plans.

162. Mr George Steven farms 400 hectares near Timaru with his partner, Vicky. He has a Bachelor of Agricultural Science from Lincoln University and was the National Young Farmer of the Year in 1994. Farming includes sheep, crops, deer, bull beef and calf rearing and he is weighing up the prospects of going into dairying. Around 70 hectares of his farm is in the HDI command area. After failing to obtain water through the Aoraki Water Trust proposal, he drilled for water and is in the final stages of irrigating this 70 hectares from that source. He spent $100,000 drilling for water and his consent to use this groundwater resource was the second to last to be granted in his area which is now classified by the Regional Council as a red zone.

163. He made the point that he is not supporting HDI primarily out of self-interest because he now has his own water supply but he went on to say, and gave examples, of how important irrigation can be for production and consequently income reasons. He also made the point that irrigation opens up the potential to use less nitrogen through better clover production.

164. He went on to say that over time, land uses will change and he believes that the HDI area will eventually support a much larger arable industry than at present. A world record wheat crop has recently been grown north of Oamaru under irrigation and oil seed and rape, both of which are used for bio-fuels and edible oil, are well suited to this area.

165. He asserted that the scheme and farm management plans propounded by Ms Mulcock and Mr Brown will work and that nitrate contamination of water supplies and waterways will be minimal because current irrigation proposals are not proposing flood irrigation on free draining soils. The nature of the soils in the area he was talking about require water application little and often and rarely beyond field capacity. Unlike the Canterbury Plains, there is very little base water in this area. This was confirmed by other witnesses.
166. Mr John Coles is the Mayor of Waimate District and he gave evidence before us on behalf of his own district and on behalf of the Mayors of Timaru District and Waitaki District. He said that irrigation has a significant positive impact on an individual farms financial performances and on employment opportunities. He considered that the Allocation Plan has got the balance wrong in favour of the environment and he supported 100 cumecs cut off flow, which he said was fundamentally important.

167. He gave personal evidence about experiencing a drought in the 1969-1970 year, which he said was his worst drought in 45 years of farming. He could hardly give stock away, lambs had to be weaned and they showed poor quality. He said it took three years to recover, to rebuild his stock and start earning an income. The event took a big toll on his family life.

168. He also made the point that there is a need to protect the Waimate District water intakes for community water schemes. These are in Waitahaha and in the Lower Waitaki River. Both schemes are now linked. So while supporting HDI in his capacity as Mayor of Waimate District, he said it is important that those schemes are protected. In answer to a question from Commissioner Skelton, he said that although the two schemes are now linked, one intake is downstream of the proposed HDI intake in the Lower Waitaki River and consequently could not be affected.

169. Mr Murray Bruce is a lifelong farmer in coastal Waimate, which has an average annual rainfall of 550 millimetres. There was an extreme low in 1969 of 287 millimetres and a high in 1986 of 1,025 millimetres. He has had 60 years experience of the vagaries of farming and weather. He portrayed drought as the ultimate disaster for farmers and he gave a graphic description of the effect of prolonged drought. For these reasons, he strongly supports the HDI Scheme.

170. Mr David Husson farms 455 hectares at Esk Valley. This is a mixed cropping and livestock farm carrying 1,600 ewes, 180 two year bulls, 4,000 lambs for finishing between November and July. His predominant income is from crops: Wheat, grass seed, barley and peas and so on. His farm comprises easy rolling country. He employs 2.5 people on a permanent basis and he is in the HDI command area. He was asked to give evidence in support of HDI. He talked, as others had done, about the effects of drought, particularly in 1969 and 1988. He drilled a deep bore with negative results. He has applied for consent for another
bore but he is now in a red zone and does not consider this a realistic alternative as a source of water.

171. Two small streams flow through his property but they have infrequent flows and there is no suitable terrain for harvesting and storing water. Currently, therefore, his is a dry land farm and to develop it he needs irrigation. He is experienced in doing soil testing to establish nutrient requirements. He has a nutrient budget to minimise losses to groundwater and he has trialled minimum tillage and direct drilling.

172. In answer to a question from Commissioner Skelton, he said that Esk Valley, where he farms, is on the south side of the Otaio River inland from St Andrews.

173. Mr Tom Henderson has farmed at Pleasant Point and also had farms at Totara Valley and Opihi. He is currently Vice Chairman of the South Canterbury Branch of Federated Farmers. He gave evidence about the history of installing irrigation on his farm properties since 1963. He was asked by the South Canterbury Branch of Federated Farmers to give evidence to support the HDI Scheme based on his experience with the Opuha Dam development in which he was involved. He told us that the Opuha Dam irrigates 16,000 hectares and generates up to 7.5 megawatts of electricity. He produced an independent report on the impacts of the Opuha Dam on the economy of the community that is served by it, which was completed in August 2006.

174. In answer to a question from Commissioner Skelton, he agreed that there is one very important difference between the Opuha Dam concept and HDI, namely that the latter is a run of the river scheme, whereas Opuha is a storage scheme.

175. Mr Mathew Harcombe has been a senior advisor to South Canterbury Federated Farmers for the past seven years and is based in Dunedin. He supports a reduced flow in the Lower Waitaki River as sought by HDI to meet the expected reliability of that scheme. He asserted that the scheme is not contrary to the objectives and policies of the Allocation Plan.

Conclusion

176. The evidence of Mr Ford and the impressive array of witnesses just referred to is persuasive when it comes to deciding on the need for irrigation in the HDI command area and the benefits this can bring to the farmers themselves and the economics of their activities as well as the
economy of the South Canterbury region. It is clear to us that there are problems in this area when it comes to reliable sources of irrigation water and that it is unlikely these can be solved from in catchment sources. Whether the source now chosen by the applicants can be made available in terms of this present application is still a major question for us involving the consideration of several potentially conflicting points of view and we continue now to consider these matters.

A Reliable Supply of Water for the HDI Scheme

Waitaki River Hydrology

177. Roderick Henderson is a scientist in the Catchment Processes and Water Resources Group at NIWA and has been a practising hydrologist since 1979. He holds the following qualifications: M.Sc. (Resource Management) (1979) and B.E. (Civil) (1977). Mr Henderson explained that the flow at Waitaki Dam is sourced from a number of hydrologically distinct regions as follows:

i. Three large lakes formed by glacial moraine dams (Tekapo, Pukaki and Ohau, controlled for hydro generation and with Tekapo and Pukaki managed for seasonal storage) constitute 80% of the flow from 40% of the catchment area;

ii. The Ahuriri River measured at the Diadem flow recorder constitutes 6.5% of the flow from 6.5% of the catchment area;

iii. Other catchments (Twizel, Mary Burn, Irishman and Forks) influenced by north-west weather conditions constitute 3% of the flow from 6% of the catchment area; and

iv. The remainder of the catchment area upstream of Waitaki Dam, including the catchments draining into Lake Benmore (excepting the catchments described above), Lake Aviemore and Lake Waitaki constitutes 10% of the flow from 48% of the catchment area.

179. Below Waitaki Dam there are a number of tributaries, adding an additional 4% to the flow at the Waitaki Dam. The largest of these is the Hakatame River, which contributes 45% of this additional flow (Keane, 2005).

180. He also said that steep gradients of rainfall and high spatial variability in evaporation and other climatic influences result in varying water yield throughout
the catchment. However because of the quality of measurements of flow in the River he did not consider those matters further.

181. Mr Henderson then described how the development of hydropower dams and canals in the Waitaki Catchment, the impounding of water behind those structures, and the management of the system for hydropower generation, had made a significant difference to the hydrology of the Waitaki River. He said that this makes meaningful long-term comparisons of hydrological statistics directly from the measured data difficult because changes have occurred at several stages during the historical record. For example:

i. The levels of and flows from Lakes Pukaki and Tekapo have been controlled since 1947 and 1950 respectively;

ii. Lake Pukaki has been raised twice, most recently in 1977 by more than 30m, so that managed storage in the catchment has increased markedly, and

iii. Power stations and the associated dams have been built at Benmore (commissioned in 1965), Aviemore (1968) and Waitaki (1934).

182. The changes in management and amount of managed storage in the Waitaki Catchment he had described meant that flows actually recorded cannot be compared over the complete period of record. To do that he said required simulation of long records with consistent assumptions about management (or no management) which then allowed comparison of the relative magnitude of changes between scenarios, and comparison of the impact of historical extreme events such as periods of low inflow. One such scenario was that of the unregulated catchment, i.e. what flows would have occurred if no hydro development had taken place.

Unregulated Flow Simulation

183. Mr Henderson said that to simulate unregulated flows in the Waitaki River between the lakes and Waitaki Dam, four components were needed:

iv. Calculated inflows to the three lakes (Tekapo, Pukaki, Ohau) were used to simulate outflows from each lake.

v. The flow record from the Ahuriri River.
Flow records from measurement sites in the rest of the upper Waitaki catchment that were influenced by northwest weather conditions (Twizel, Mary Burn, Irishman and Forks).

184. Flow from the remaining 48% of the catchment area, representing 10% of the flow at Waitaki Dam, was estimated by correlation with the Lake Ohau inflow series.

185. He said that when the four component sets of flows were added, they equal the flow record at Waitaki Dam. Minor differences were found, and those were adjusted. The flow simulation process resulted in a time series of unregulated daily flows at Waitaki Dam. Unfortunately he did not describe the basis of the balance (e.g. time span used) nor the quality of input data through the extended record period.

Flow and Climate Variability

186. River flows are inherently variable, they fluctuate according to the weather systems that pass over New Zealand. For unmodified catchments there are a number of simple statistical analyses that can be applied directly to historical flow data to predict future flow patterns. The development of hydropower dams and canals in the Waitaki Catchment, the impounding of water behind those structures, and the management of the system for hydropower generation, have made a significant difference to the hydrology of the Waitaki River.

187. Meaningful long-term comparisons of hydrological statistics directly from the measured data is not possible because changes have occurred at several stages during the historical record. We were told by MEL however that there is currently no proposal to change the management of the hydro system in the Waitaki Catchment which has been in place since 1979.

188. Flow records for the Waitaki River date from about 1925 and hydrologists undertaking statistical analyses of the flow data were faced with deciding which period of record would allow the most meaningful long-term comparisons to be made and if that involved using flow data that predated 1979 how best to incorporate the management and storage changes.

189. Mr Henderson's view was that because of the uncertainties about the future hydrology, and the known effects of decadal variability, the prudent approach was to use the complete flow dataset available for modelling the effects of
irrigation on the Lower River, and for modelling the reliability of irrigation water. The use of the complete record he said allowed a better appreciation of the potential effects of historical droughts, many of which had occurred in the period preceding the filling of the Pukaki High Dam. But to use the complete record, it was necessary to use simulated scenarios in order to remove the effects of changing management over time.

190. Mr Henderson also placed considerable emphasis on the variation of flow in the Waitaki River that results from the changing phases of the Interdecadal Pacific Oscillation (IPO) and of climate change.

191. Mr Henderson pointed out that the flow statistics of the Waitaki River in the most recent IPO positive phase (1979-1999) were much higher than the same statistics for the negative phase (1946-1978), and also higher than the previous positive phase (1931-1945). In his opinion the strength of this recent positive period was such that the mean flow for the two early periods was less than the long-term value. The recent (1979-1999) mean flow (391 cumecs) was 13% higher than the negative IPO value of 346 cumecs, 10% higher than the previous positive IPO value of 354 cumecs, and 8% higher than the long-term mean of 362 cumecs. It was Mr Henderson’s view that the magnitude of effect in the recent phase, and the difference from the previous positive phase mean that it is not possible to be definite about the effect of future changes to the IPO.

192. He said that the magnitude of climate change is very uncertain, as the range of precipitation scenarios is large (0% to 20%+ increases). However the increase of flow is expected to be greater than the increase in precipitation, since most of the excess is delivered to the river system.

193. Mr Henderson did however caution that when considering the results presented in his evidence it was important to remember that a model is a tool for making estimates of reality, given a set of assumptions and constraints. He added that any good model of future scenarios will only provide realistic estimates of some aspects of the future and will have limitations in estimating other aspects. No model is perfect. But he believed that the modelling results at Waitaki Dam were a reasonable estimate of what would eventuate in the future.
Modelled Flow Scenarios at Waitaki Dam

194. Graham Searle is a Senior Commercial Analyst at Meridian Energy Limited. He holds the qualifications of Bachelor of Commerce and Administration and a Master of Business Administration.

195. Mr Searle said that the model development was to overcome the limitation that actual flow records prior to 1979 are unrepresentative of the current river management regime. He said that the series presented at this hearing was the same flow series that was presented to the Waitaki Water Allocation Board in 2005. The model included details of the entire Waitaki Power Scheme as it existed at that time.

196. Mr Searle said that the historic Waitaki Catchment inflows for the years 1931 to 2004, were entered into the model. The model calculated hourly generation for the eight current stations as if they were satisfying the New Zealand electricity market as at the present. This was carried out in modelling blocks of one week and optimised water management and electricity demands for that week. The model also had monthly and seasonal constraints so water was stored over the high inflow periods of Spring – Summer, and released during periods of high demand during Autumn – Winter. The model results were averaged to daily data for the Water Allocation Board, and it was this data that was again used for the HDI project.

197. The model also used the existing consent conditions and operating philosophies of the Waitaki Hydro chain. This meant that the modelled discharge never fell below 150 cusecs (120 cusecs minimum flow + 30 cusecs buffer).

198. Mr Searle pointed out that the modelling undertaken for the Water Allocation Board did not include the proposed abstraction by the Mackenzie Irrigation Company (MIC) or the now operative Benmore Irrigation Company (BIC). Nor had they been included for the HDI project as the combined MIC + BIC abstraction is only 201.6 million cubic metres, or 1.79% of the average annual volume discharged by the Waitaki Scheme.

199. Mr Searle also said that the daily river flows immediately downstream of Waitaki Dam from 1 July 1979 to 30 June 2004 have been compared to actual recorded daily average flows. The comparison showed that the simulation is a close approximation to actual river management. Mr Searle said that given the data match that was obtained the simulated flows July 1st 1931 to June 30th
2004 (73 complete water years) have been adopted as the base line river flow series at Waitaki Dam for assessment of effects of HDI on the Lower River.

200. As a further check Mr Henderson also compared HDI Status Quo at Waitaki Dam with recorded data at Waitaki Dam and with the unregulated simulation at Waitaki Dam since 1979:

vii. In the flood range both recorded and HDI Status Quo flows at Waitaki Dam are significantly smaller than those that would have occurred in the unregulated situation. While in the mid range the distribution of Actual Recorded and HDI Status Quo at Waitaki Dam are practically the same.

viii. In the low flow range, both recorded and HDI Status Quo flows at Waitaki Dam show a significant difference from the unregulated case. Flows are sustained at higher levels between 400 cumecs and the minimum flow.

201. There were differences of up to 12% between the seasonal variation for HDI Status Quo at Waitaki Dam and recorded flow at Waitaki Dam. Those differences reflect the fact that the model only considered the Waitaki Power Scheme and not other generation plant around New Zealand. The differences are not critical, in Mr Henderson's opinion, to the use made of the simulation results in other evidence.

202. The similarities between the recorded flows at Waitaki Dam and the simulated HDI Status Quo at Waitaki Dam from July 1979 to June 2004, particularly in the mid and low flow ranges, also gave Mr Henderson confidence that the simulated flows from 1931 to 2004 are suitable for assessing the potential impacts of the proposed HDI irrigation abstraction.

**Simulated Scenarios at Bell's Pond**

203. The HDI Status Quo at Waitaki Dam data was then used in an EXCEL spreadsheet by Mr Searle to simulate the residual flow immediately downstream of the last irrigation abstraction point to quantify for each scenario how often irrigation was restricted, and therefore define irrigation reliability.

204. The spreadsheet did not predict flows in the River at any point above the last irrigation abstraction point, and tributary inflows and groundwater interactions
downstream of Waitaki Dam were not included in the model as it was considered that they would be partly or fully offset by any MiC/BIC abstractions.

205. Mr Searle said that the scenarios simulated at Bell's Pond were:

i. HDI Status Quo with existing irrigation takes (i.e., up to a maximum of 56 cumecs) and the smallest existing consented minimum flow of 80 cumecs (HDI Status Quo);

ii. Existing irrigation including an allowance for non-irrigation takes plus HDI (i.e., 56 + 20.5 cumecs) with 150 cumecs minimum (HDI 150 Existing+HDI);

iii. HDI full irrigation uptake (i.e., 90 cumecs) including an allowance for non-irrigation takes with 150 cumecs minimum flow (HDI 150 Full);

iv. Existing irrigation including an allowance for non-irrigation takes plus HDI (i.e., 56 + 20.5 cumecs) with 100 cumecs minimum (HDI 100 Existing+HDI); and

v. HDI full irrigation uptake (i.e., 90 cumecs) including an allowance for non-irrigation takes with 100 cumecs minimum flow (HDI 100 Full).

206. Irrigation takes decrease the mean flow in the river at Bell's Pond and the size of this decrease is slightly affected by the minimum flow rule that is applied. The change of minimum flow rule does not change the median flow.

Minimum Flows

207. Minimum flows at Waitaki Dam, as indicated by the mean annual 7-day low flow (MALK), are considerably higher for the simulated scenarios than for the unregulated case.

208. The flow is less than 150 cumecs for 5% of the time in the HDI Status Quo scenario, and is below 100 cumecs for approximately 1.5% of the time reflective of the fact that irrigators have an 80 cumecs flow cut-off, but with Meridian’s 30 cumecs buffer on top of the 120 cumecs minimum flow at Waitaki Dam that flow is never reached.

209. The four scenarios modelled assume that irrigation restrictions prevent the minimum flows being breached. The Full irrigation scenarios are identical for 93% of the time. With full irrigation uptake and a minimum flow requirement of 150
cumeecs, flows were at 150 cumeecs for 7% of the time. With full irrigation uptake and a minimum flow requirement of 100 cumeecs, flows were between 150 cumeecs and 100 cumeecs for 4% of the time and at 100 cumeecs for 3% of the time.

210. Implicit in the preceding assessments is the assumption that all the existing abstractors would operate in a similar fashion to the HDI, i.e. reduce their take as the river flow drops below a particular threshold (which is dependent on the minimum flow option and the sum of the allocations), and cease taking flow when the flow at the Kurow recorder is at the minimum flow. Such behaviour by the existing abstractors would be voluntary, because under their respective existing consents, a significantly lower minimum flow is typically specified compared with the two options considered here.

Flood Flows

211. Mr Henderson also concluded from his analysis that the HDI and other abstractions as modelled would not have any significant effect on the magnitude or return period of floods in the river downstream of Bell’s Pond.

Seasonal Variation

212. Mr Henderson said that the inflows to the Catchment are lowest in winter when north-west storms are less frequent and the Catchment headwaters are frozen and highest in late spring, summer and early autumn. Electricity demand requires retention of flow in summer and early autumn so that generation can be maintained through the winter, leading to higher winter flows than would occur in an unmanaged catchment.

River Low Flows

213. A consequence of the abstraction of water for irrigation when minimum flows are in force, is that the River will spend some time at the consented minimum flow. The modelled scenarios allow an assessment of this effect by examining the amount of time at set minimum flows.

214. Low flow run statistics for the four scenarios were analysed by Mr Henderson for each water year from July to June inclusive. What was noticeable about the distribution of the most extreme water years in this analysis is that all top ten values, both of individual statistics, and the summed ranks, are before 1979.
215. Mr Henderson calculated that the average number of days per water year less than or equal to 150 cumecs would increase from 18 (4+14) under HDI Status Quo to 28 under either HDI 150 Full scenario or HDI 100 Full scenario. The average number of days per water year less than or equal to 100 cumecs would increase from four under HDI Status Quo to eleven under HDI 100 Full scenario.

216. The median number of days per water year less than or equal to 150 cumecs would increase from 9 under HDI Status Quo to 18 under either HDI 150 Full scenario or HDI 100 Full scenario. Note that a change to minimum flow makes no difference to the number of days at or below 150 cumecs. The median number of days per water year less than or equal to 100 cumecs would increase from zero under HDI Status Quo to four under HDI 100 Full scenario.

217. Mr Henderson said that the greatest numbers of days at low flow occur during dry years with the number of continuous days at low flow giving an indication of the severity of each low flow event.

218. Mr Henderson then detailed some of the statistical results of the modelled scenarios. The present (HDI Status Quo) MALF at Bell’s Pond is 147 cumecs. The MALF at Bell’s Pond would be 160 cumecs under the HDI 150 Full scenario and 131 cumecs under the HDI 100 Full scenario.

The foregoing summarises the evidence given by the applicants’ witnesses on this topic. We turn now to the relevant opposing evidence.

219. The Central South Island Fish and Game Council a submitter in opposition to HDI as proposed by the applicants also called evidence on this topic from Mr Frank Scarf who is a hydrologist and holds a New Zealand Certificate of Engineering (Civil) and a Bachelor of Science degree in Mathematics. He has worked in hydrology, water resources management and related fields for over 40 years.

220. Mr Scarf adopted a very different approach to determining the appropriate period of flow record to use for his analyses of the effects of increased irrigation on the Lower River, and the reliability of irrigation water.

221. Mr Scarf said there were problems with the extended flow record used by Mr Henderson because of:

- The highly variable quality of the flow records over the extended period.
• Storage changes resulting from raising Lake Pukaki and the building of new dams.

• Management changes that have occurred over the longer period of record.

222. Mr Scarf described how over the extended period of time the hydrological skills, technology and available resources to undertake the collection and recording flows has changed and the quality of record improved. He said that there were three periods of record of interest.

223. The first extended from 1925-1950 when there were no significant regulation of flows upstream from Kurow. The flow record for this period was based on irregular readings of lake levels at lakes Tekapo, Pukaki and Ohau together with levels on the rivers emanating from those lakes. Flow gauging sites were constrained in the main to the old highway bridge sites. His understanding was that the ratings for converting river levels to flow were of a lesser quality standard than would be the case today, reflecting the hydrological skills, technology and transport resources available at that time. Flood flows were difficult to measure without the aid of jet boats. Downstream tributary Inflows were not recorded and it was not until Waitaki Dam was completed in the late 1930s that the flow at that point was estimated based on Lake Waitaki levels and generation machine ratings.

224. The second period extends from 1950 to 1977. This record includes more detailed and rigorous recording of flows both on the main stem and tributaries throughout the Waitaki Catchment but is also the period when at times considerable volumes of the inflows were used to fill additional storage created in the upper Catchment.

225. The third period extends from December 1977 to date. This record for the Kurow site is much more reliable and is based on the flow recorded every 15 minutes at that site.

226. Mr Scarf said that he was less than comfortable about the modelling used by the earlier witnesses which models what would have occurred in the period pre 1977 with the present hydro infrastructure and decision making. To him this takes the lesser quality record pre 1977 and the error attached to modelling to obtain an estimate of flow at Waitaki Dam, and then superimposes additional modelling with its assumptions, thus further compounding the error margin.
227. Mr Scarf detailed his concerns with the modelling. He said that he examined Mr Henderson's modelled flows for the 1964-1965 water year, which coincided with the time that Lake Benmore was filled following the closing of the gates on 3 November 1964. This required about 3000 Mm$^3$. Mr Henderson's hydrographs for that season showed a continuous period of restriction for 73 days from late October to mid January and for the previous pre Benmore filling 1963/64 year he showed 78 days of restriction under the HDI 150 Full scenario.

228. Mr Ford, who we referred to in the previous section of this decision, had used the simulated flow scenarios based on Mr Henderson and Mr Searle's modelling to examine agricultural impacts of irrigation based on these scenarios.

229. When Mr Scarf compared Mr Henderson's hydrograph for the 1964/65 year with Mr Ford's chart, he said that the two charts did not reconcile. Mr Henderson shows total restrictions from the end of October to about mid January, but Mr Ford's chart appears to have full restrictions from early December through to about mid February except for a short break in early February.

230. He then pointed out that the 1976-78 period was coincident with the raising of Lake Pukaki by 37m, adding about 5500 - 6000 Mm$^3$ to storage within the Upper Waitaki basin. Putting that in perspective, to fill that additional storage would require diverting the whole flow of the Waitaki River at Kurow for about 180 days. By February 1977 the Pukaki high dam was almost complete and the Tekapo Canal was also commissioned in May 1977. Some filling of the increased storage capacity occurred during the 1976/77 water year but filling the remainder could not be undertaken until after completion of Tekapo B powerhouse in June 1977. It took a further eighteen months from September 1977 through to April 1979 to reach the new maximum operating level.

231. Mr Scarf explained that the hydrographs presented by Mr Henderson for the 1977/78 water year contained a large number of low flow days between September and February. In Mr Henderson's HDI 150 Full scenario for that year the number of water restriction days would be 121 days the highest in the 73 years of record he modelled and for the 1976/77 water year there would be 76 days of restrictions.

232. Turning to the rainfall records in the Upper Catchment Mr Scarf said that at Mount Cook for the 1977/78 calendar year rainfall was 3287 mm and this was only the seventh lowest since 1935. Rainfall over the 8 month irrigation season
that water year was 2409 mm and this was the 17th lowest since 1935. The extent and duration of modelled 'low' flow occurrences in Mr Scarf's opinion do not reconcile with the rainfall data leading Mr Scarf to conclude that the modelling had not adequately taken into account the water diverted to fill the Pukaki high dam.

233. Mr Scarf said that the above instances together with his concerns regarding the reliability of the earlier flow data and the potential for compounding errors with the modelling, convinced him to use only that flow data recorded at Kurow since July 1979. He considered that record to be an accurate reflection of Mel's management and decision making since substantial completion of the existing Upper Waitaki power generation project in 1978.

234. Mr Scarf used the record extending from 1 July 1979 through to 9 May 2007. This included two periods of extended missing record which he filled in using standard hydrological techniques that are accepted for replacing lost records. In total, the record covers 9537 days or just over 26 years.

235. Mr Waugh's stated interest was to increase the flow in the smaller foothill rivers by replacing current abstractions from those rivers by diverting water from the large alpine rivers. Mr Waugh also raised the issue of climate change and supported the view that the period from 1978-1999 was the most reliable indication of the future climatic trend in the Upper Waitaki Catchment. He said the mean annual rainfall at Mt. Cook Hermitage (1930 - 1977) was 4039mm. This increased to 4522mm for the years 1978-1999, an increase of 12 percent and a similar increase in rainfall of 15 percent has been observed for the same period at Milford Sound. He said this demonstrated the relationship between rainfall in these upper catchment sites and flows over Waitaki Dam.

236. He pointed out that Mr Henderson in his evidence on the North Bank Tunnel Scheme noted that the mean flow at Waitaki Dam (1980-2003) was 384.6 cumecs and was 7% higher than the long term mean and 8% higher than the IPO period 1979-99.

Discussion on Choice of Period of Flow Record

237. Fundamental to determining both the effects arising from implementation of the HDI scheme and the limitations on the scheme's operation and viability at various minimum flows is an accurate understanding of the flow passing through the Waitaki Dam impounding reservoir. As Mr Henderson explained development together with changes of the management of the system made long-term comparisons of hydrological statistics directly from the measured data difficult.
238. We were presented with two differing expert opinions of how best to achieve that understanding. Mr Henderson's solution was to generate an extended record (1931 – 1999) of unregulated flow by using the calculated inflows and then impose the current scheme management upon them. Mr Scarf was not comfortable with Mr Henderson's approach and chose to use the shorter measured record from the Kurow recorder (1979 to 2005).

239. If the quality of both records were comparable the use of the extended record would have been appropriate. However Mr Henderson's use of modelling to extend the length of the flow record inevitably introduced errors into the model's predicted flows and the magnitude of those errors determines the appropriateness of the model for its intended use.

240. Unfortunately no error bands were assigned to the predicted flows other than Mr Henderson told us that there were differences of up to 12% between the seasonal variation for HDI status quo at Waitaki Dam and the recorded flow at Waitaki Dam.

241. Mr Henderson's basic methodology of using the inflows to the glacial lakes, the flow record from the Ahuriri River and available measuring sites in the Upper Catchment together with correlated data for the remains of the catchment to simulate unregulated flows in the Waitaki River between the lakes and Waitaki Dam was logical. However, the accuracy of those simulated flows is very dependent on the accuracy of the measurement of that inflow data and methodology used to convert measured water levels to inflows.

242. Mr Scarf described to us the limitations of flow data collection in the 1925 – 1950 period and he also explained how prior to 1979 the creation of further storage in the Upper Waitaki Catchment both by raising Lake Pukaki and the building of additional hydro dams and storage reservoirs is another factor that added to the difficulty of predicting accurate simulated record of the unregulated inflows.

243. Mr Scarf presented evidence at both the HDI scheme hearing and the Lower Waitaki River applications hearing in which he stated that, in his opinion, that storage filling had not been adequately accounted for in the generation of the simulated flows and consequently depressed the simulated flows over those filling periods.
244. Mr David Leong the section 42A reporter addressing hydrology at the HDI hearing was asked by us if he had an opinion on whether or not storage was adequately accounted for in the simulated flow records. He said that he had not specifically examined that matter but believed from a preliminary examination of the data that storage filling had been taken into account. However at the later Lower Waitaki River hearings Mr Scarf refuted that view and presented additional evidence to support his opinion that storage filling had not been adequately addressed. At that hearing no other expert evidence was presented on this matter.

245. The lack of error bands for the models predicted flows made our task of determining the appropriate period of flow record difficult however the following two matters were significant impediments to the use of the extended record:

   i. The variable quality of the inputs; and

   ii. The manipulation of the Plexos Model output to a form suitable for the scenario analyses

246. The volume of water the applicants seek to abstract for this proposal is quite small compared with the flow in the River and to determine reliability of water supply requires a level of predictive precision which may well be within the error bands of the modelled flows (particularly low flows).

247. The mean abstractive flow of the HDI scheme over an irrigation season is less than 4% of the mean flow of the Lower Waitaki River (360 cumecs). The errors associated with using lake levels, correlation from multiple sites, and lesser quality rating curves suggests that errors similar to the seasonal variation differences could be expected.

248. Also the long term record may be atypical of the current and likely future pattern of flows due to climate change. We were told by Mr Waugh that the mean annual rainfall at Mt. Cook Hermitage (1930 - 1977) was 4039mm. This increased to 4522mm for the years 1978-1999, an increase of 12 percent and a similar increase in rainfall of 15 percent was observed for the same period at Milford Sound. The increased rainfall is reflected in flows at the Waitaki Dam and there is a decreasing trend in the number of days of restriction in the tables presented by Mr Henderson for the 1978 – 1999 period which is not evident in his tables for the earlier period.
249. The 1979-2004 flow data used by Mr Scarf was derived from a flow recorder sited immediately below the Waitaki Dam. The recorder is sited on a stable single channel. The site is the control site selected in the Allocation Plan for determining resource consent compliance.

250. The maximum term for a consent is 35 years which is unlikely to cover more than one changing phase of the Interdecadal Pacific Oscillation (IPO) (which was a concern raised by Mr Henderson) and the flows currently indicate that climate change and the consequential higher flows will persist through that period. The flow trend for the 1979 – 2004 period is more likely to match the predicted trend over the term of any consent if granted.

251. Finally, the shorter period of record was used for the North Bank Tunnel Concept and at that hearing we were told that the viability of that proposal was marginal and was inextricably linked to the volume of water passing through Lake Waitaki. It follows that there was considerable confidence in the shorter record.

252. We believe the dominant influence in the immediate future is likely to be climate change rather than decadal variability. Also the concerns relating to input and methodology of extending that shorter record could in our opinion introduce unacceptable error into any predictions of restrictions for water availability based on the extended record.

253. As a consequence those analyses of the reliability of supply and lost revenue which were based on the extended record will, in our view, overstate the restrictions that will be imposed by the various minimum flows on the HDI’s ability to abstract water.

Conclusion on the Period of Record

254. It will be apparent from the foregoing that we have accepted Mr Scarf’s evidence that the appropriate period of record for the purposes of this case is the shorter and more reliable period adopted by him. This finding takes us the next step which is a consideration of the reliability of supply of water for the HDI scheme.

Reliability of Supply

255. Mr Potts had examined the existing limitations of accessing either surface water (with or without storage) or groundwater resources within the scheme area and he said that the development for an irrigation scheme within the command
area was not considered viable without an external source of water. He also described how to determine the water required for the HDI scheme he had constructed a projected seasonal distribution of the irrigation demand. This data was used by Mr Searle (Modeled Flow Scenarios), Mr Ford (Agricultural Impacts of Restrictions of Water Supply) and Mr Davis (Financial Implications of 100 cusecs minimum flow versus 150 cusecs) in the preparation of their evidence. Mr Scarf in examining the projected distribution noted that for the HDI demand profile, the annual volume based on that monthly data is 279 Mm³/yr and some 11% higher than that stated in the application.

256. He also noted that subsequent modelling by Henderson and others to assess potential restriction on future irrigation assumes that water is taken at these rates continuously. As a result the number of days on restriction, both total and partial, are likely to be overstated from their modelling.

257. Mr Scarf constructed a seasonal irrigation use profile that was similar to that provided by Mr Potts but each value was proportionately reduced to be consistent with the 1250 million cubic metres per annum rule in the Allocation Plan and the application.

258. Mr Scarf assumed equal access for all those authorised to take water within the 90 cusecs/ 1250 Mm³/yr block, which is also the assumption of the applicants' witnesses. However, he acknowledged that if that assumption was incorrect any analysis that was carried out using that assumption would also be incorrect.

259. Mr Scarf's analysis for the full 90 cusecs peak rate using the Kurow flow data for the irrigation seasons (1979 to 2004) shows that for the irrigation season, the reliability of supply for existing and new irrigation within the 90 cusecs/ 1250 Mm³/yr allocation block is 95.1% of the time. Thus restrictions would exist 4.9% of the time. Of this, only on 0.13% of the time (eight days out of 6391 days) would there have been full restrictions.

260. It was Mr Scarf's opinion that based on the actual flow record since 1979 the reliability of supply to existing and new irrigators (given equal priority) is marginally better than the 95%. referred to for new consent holders in Policy 46 of the Allocation Plan. But existing irrigators would not be receiving the protection of their current reliability envisaged under Rule 7 of the Plan.
261. Some irrigation restriction would have occurred in 24 of the 27 seasons included, with full restrictions being imposed for a short period in 4 of the 27 seasons. The maximum number of consecutive days on full restriction was 4 days.

262. Mr Scarf’s analysis highlighted that the most likely month for irrigation restriction was December with more than double the frequency of any other month and that the water years with the highest number of irrigation restriction days were 1989/90 (29 days), 1992/93 (30 days) and 2005/06 (30 days) followed by 2006/07 (24 days), 1997/98 (22 days), and 2003/04 (21 days).

263. Of the 27 seasons analysed, the longest period on full restrictions was 4 consecutive days from 23/12/89 to 26/12/89. The longest period on partial restrictions (including any full restrictions occurring within the period) was 16 days between 5/10/92 and 20/10/92.

264. Finally, Mr Scarf addressed reliability if priority was afforded to existing consent holders and flow sharing was applied to all abstractions. This he said would significantly increase the number of days HDI would be on total restrictions. This assumed also that the existing consent holders had agreed to take only that water which is reasonably required in accord with Mr Potts seasonal distribution.

265. Under that scenario, he said HDI would be on partial restrictions for 1.3% of the time and on full restrictions for 2.8% of the time, compared to 4.8% and 0.1% respectively under the no priority scenario. The period on full restriction averages out at about 8 days per year. This ranges between zero and 22 days per year for the 27 year data period with 16 consecutive days on full and high partial restriction occurring in 1992/93.

Conclusion on reliability of supply

266. We agree with Mr Potts and Mr Waugh that the logical source of water for the HDI scheme is the Lower Waitaki River. The foothill rivers and streams in the scheme area are already under stress from existing irrigation abstractions and the groundwater resource is similarly under stress. Having accepted Mr Scarf’s evidence about the appropriate period of record it follows that, subject to what we say below, we also accept his evidence on reliability of supply.
267. We accept Mr Scarf’s evidence about reliability of supply in preference to those witnesses for the applicants who, based on Mr Henderson’s and Mr Searle’s evidence about the longer period of record, concluded that a 100 cumecs low flow cut off was necessary in this regard to give the required reliability. It is our conclusion which we now record at this point that it is not necessary to have a 100 cumecs low flow cut off in order have a reliable water supply for this irrigation scheme. That reliability can be obtained at the Allocation Plan’s minimum flow of 150 cumecs.

268. This is an important and indeed a fundamental finding in the context of this case because much of the applicants’ evidence was designed to persuade us not only that the 100 cumecs low flow cut off was necessary but that to provide for it would not have significant adverse effects on the Lower Waitaki River and the many values it has both in-stream and out-of-stream.

269. With the conclusion just reached about retaining the Allocation Plan’s minimum flow of 150 cumecs it becomes unnecessary to consider most of that evidence except to the extent that it bears on effects in the light of the environmental flow regime for the Lower Waitaki River and this is the way we will proceed from now on in this decision.

270. This finding about the appropriate reliability of supply also has implications for other applicants who we describe here as the MRNAG mains stem applicants and also two other applications below Black Point. It means that those of them who also sought a low flow cut off of 100 cumecs will not succeed in that endeavour. The consequences for them will be discussed more fully in decisions still to come.

271. However one of the matters that existing consent holders raised at this hearing and this included some of the applicants as well because they have existing consents, had to do with an issue about the effect of granting HDI on the reliability of their existing consents. Under the next sub heading we are going to deal with this matter and it will be seen that we have arrived at a solution that will in fact protect existing consent holders without adversely affecting either HDI or the applicants earlier referred to. We turn to that matter now.
272. Mr Scarf did a calculation for reliability of supply based on existing consent holders having priority over new consent holders but assumed that we could alter existing consent conditions (as did the applicants’ witnesses). We have no power to review the conditions of any existing consents. Our authority is confined to determining the new applications while having regard to the effects that those new consents would have on the existing consent holders.

273. We have taken this to mean that the cut-off flow for the new consents would possibly need to be at or above the flows at which existing consents abstract water. None of the witnesses adopted this as a basis for determining reliability. However based on all the material before us in these proceedings we have been able to deal with this matter of effects on existing consent holders in a way that protects their interests and still provides the HDI scheme with a reliable water supply. Our reasoning follows under the next sub-heading.

Flow at Which Abstractions Should cease

274. Not all Lower Waitaki River applicants we heard from as a part of the current hearing process sought the same minimum flow cut-off. Some sought a variable monthly minimum flow based on the proposed NBTC regime. As an alternative, they sought a 100 cumecs minimum flow but they recognised that this was dependent on an agreement with MEL about who should have to start ramping down at say 190 cumecs. Waihao Downs Irrigation Limited sought a 100 cumecs minimum flow cut off but stated it would accept a 150 cumecs minimum flow cut-off. The non-consumptive take by Clarkesfield Holdings (1996) Limited for hydro electricity generation also sought a 100 cumecs minimum flow cut-off but it discharges back to the Lower Waitaki River. Three applicants (Torach Farms Limited, Waitaki Orchards Limited and D.D and V.J Chalmers) sought a 150 cumecs minimum flow cut off with the exception that in the case of Waitaki Orchards Limited it did not want to be bound by the cut-off flow for its frost fighting activity.

275. Critical to the Allocation Plan’s flow regime for the Lower Waitaki River are Policies 45 and 46. While Policy 45 addresses the environmental flow regime for the River, Policy 46 addresses the issue of resource use.

276. Policy 46 states inter alia:

"By maintaining a flow of water into the Lower Waitaki River downstream of the Waitaki Dam that is sufficient to maintain:
vi. “the minimum flow and flushing flows of the environmental flow regime for the Lower Waitaki River; and

vii. the aggregate of the actual requirements, up to a maximum of 80 cubic metres per second”.

277. There was a view among irrigators that it was the intent of Policy 46 that the flows into the Lower Waitaki River would be such, as to maintain the minimum flow plus the additional flow requirements to meet the annual allocation of all existing and new water use activities (with the exception of new agricultural and horticultural activities, which have a reliability of 95% of the peak rate of taking).

278. The explanation provided in the Plan for Policies 45 and 46 is not clear in terms of the intent of this provision, with more emphasis placed on the environmental flow regime. However, it does state that “Because the flow in the river is artificially controlled, the reliability for downstream users is dependent on the pattern of flow releases”. This suggests that the reliability for users of the water downstream of the Waitaki Dam and the management of the Dam releases are intrinsically linked. This is also indicated by Policy 46 with the closing statement; “up to a maximum of 80 cubic metres per second”. This suggests that there is an expectation that the flow into the Lower Waitaki River will be maintained up to a maximum of 80 cumecs above the minimum flow in accordance with Rule 7 Table 6.

279. The rules in the Allocation Plan that give effect to these policies are Rule 2 and Rule 7. Rule 6 addresses annual allocation of water to activities, and is primarily concerned with other policies in the Plan that address efficient use of water.

280. Rule 2 contains Table 3, which provides the environmental flow and level regimes for water bodies in the Waitaki Catchment. Row xvii of Table 3 provides the environmental flow regime for the Lower Waitaki River. The minimum flow in the Lower Waitaki River is set in Table 3 as 150 cumecs from the Waitaki Dam to the sea (with the exception that it can fall below this if inflows to the hydro-dam system are below the 1 in 20 low). For the whole of the Lower Waitaki River a maximum allocation limit of 90 cumecs is set for all takes (regardless of use), but excluding diverts and discharges back into the River above Black Point which covers, for example, the NBTC.
281. The measuring site is the Kurow recorder, and flows are based on 1-hour rolling averages. Table 3 also states that there is no flow-sharing regime for the Lower Waitaki River. Flow-sharing is defined in the Allocation Plan as "The apportioning of flow between in-stream uses and the cumulative taking and diverting of water, as specified in Rule 2(c)."

282. Rule 2(c) states:

"the take or diversion complies with a flow-sharing regime such that no more than half of the water above or between the thresholds in Table 3 can be taken or diverted..."

283. Reading Rule 2 in isolation from the other rules in the Plan, it appears as though a minimum flow of 150 cumecs needs to be maintained from the Waitaki Dam to the sea, with the allocation limit above that minimum flow (90 cumecs) needing to be managed in such a way as to ensure that the minimum flow regime is maintained. As the Plan does not require a flow-sharing regime in the Lower Waitaki River, the management of the allocation block above the minimum flow does not need to provide for in-stream values or uses because these are provided for by maintaining the minimum flow from the Dam to the sea. Therefore, how the 90 cumecs allocation block is managed amongst users above the minimum flow prior to the implementation of Rule 7 is not specified in the Plan.

284. To provide the reliability to existing users above the minimum flow as outlined in Policy 46 and Rule 7 of the Plan requires the consent holder for the Waitaki Dam to provide flow into the Lower Waitaki River, up to a maximum of 80 cumecs between October to March, (inclusive). The Rule states that the provision of flows to the Lower Waitaki River should be sufficient to meet the actual requirements of activities identified in Policy 46(ii) (at their points of taking), up to a maximum of the flows in Table 6. Therefore, the Plan intends to provide the reliability to abstractive users above the minimum flow through discharging of water from the Dam.

285. However Rule 7 cannot be enforced until the Dam consent is renewed, which is not due to occur until 2025. This was recognised by the Allocation Board in its decision on this provision and it has to do with the limitations on the power of the Regional Council to review existing consents during their currency. We think this is now common ground amongst all parties. We discussed a similar point in our decision on NBTC.
286. This creates a problem in timing for the implementation of the Policies 45 and 46 in the Plan. Furthermore the RMA does not allow the redistribution of resources allocated to an existing consent to other users.

287. The existing users on the mainstem below the Waitaki Dam have conditions that place them in one of six bands. Those bands have conditions that impose the following restrictions on the abstraction of water:

**Band 1**  Abstraction ceases whenever the flow in Lower Waitaki River at Kurow, falls below 80 cubic metres per second.

**Band 2**  Abstraction ceases whenever the flow in the Lower Waitaki River at Kurow, falls below 80 cubic metres per second. Abstraction is reduced to half the maximum rate whenever the flow at Kurow falls below 100 cubic metres per second.

**Band 3**  Abstraction ceases whenever the flow in the Lower Waitaki River at Kurow, falls below 130 cubic metres per second.

**Band 4**  Abstraction ceases whenever the flow in the Lower Waitaki River at Kurow, is at or below 80 cubic metres per second. Ramping down occurs from 130 to 80 cubic metres per second.

**Band 5**  Abstraction ceases whenever the flow in the Lower Waitaki River at Kurow, falls below 80 cubic metres per second. Ramping down occurs from 152 to 80 cubic metres per second.

**Band 6**  Abstraction ceases whenever the flow in the Lower Waitaki River at Kurow, falls below 80 cubic metres per second. Abstraction reduced to 40 litres per second whenever the flow at Kurow falls below 130 cubic metres per second. Abstraction reduced to 20 litres per second whenever the flow at Kurow, falls below 100 cubic metres per second.

288. It is beyond the scope of this decision to amend the conditions of these existing consents. This can only be carried out by a review by the Regional
Council but such a review would face the problem of not being able to implement Rule 7 of the Allocation Plan until 2025.

289. In essence, such a review would require a flow-management regime to be implemented in the Lower Waitaki River whereby users would be required to either:

i. reduce their takes on a pro-rata basis when flows fall below a certain level to ensure that the minimum flow regime is maintained throughout the River; or

ii. create a water-sharing group to manage takes during times of restriction.

290. The Waitaki Dam consent in its current form has a minimum flow of 120 cumecs. The operation of the Dam consent will not provide any buffering from the minimum flow for takes below the Dam although MEL currently discharges an additional 30 cumecs above its minimum flow (i.e. 120+30) = 150 cumecs.

291. For the reasons given in an earlier sub-section of this part of this decision (Choice of Period of Flow Record) we have accepted Mr Scarf's concerns over the use of the extended period of record used by Mr Henderson and other witnesses for the applicants.

292. From Mr Scarf's analysis it is evident that even with a 150 cumecs minimum flow prescribed by the Plan all three demands: power generation, the 150 cumecs minimum flow and the full 90 cumecs scenario irrigation take can be met with very little adjustment to MEL's current and past practice over the last 26 years.

293. Until the NBTC is commissioned the flow from Waitaki Dam is likely to be managed in a manner similar to the current operating procedures.

294. Witnesses addressing the reliability of supply for various minimum flows made a number of assumptions about priority, ramping down and the ability to alter the conditions on existing consents that in our view were incorrect. In defining the flow at Kurow at which abstraction must cease we need to take into account the following factors (in addition to the ecological requirements):

i. the protection that the Plan contemplates for existing consent holders to continue to receive their existing entitlements
ii. that all irrigation abstractions downstream of the Waitaki Dam are
downstream of the Kurow recorder and therefore none of them lower the
flow at the recorder but they lower the residual flow downstream of the
abstraction point;

iii. maintaining the minimum flow from the Waitaki Dam to the Sea; and

iv. the requirement of Policy 46 (ii) (c) that the actual requirements of exercising,
up to 95 percent of the peak rate of taking, of new consents for agricultural
and horticultural activities (at their points of taking) in the Lower Waitaki
River should be met.

Conclusion

295. Having regard to the foregoing we have concluded that a minimum flow
of 152 cumecs at the Kurow recorder would ensure that any new consents
on the main stem would cease taking water at a flow greater than the flow
that any existing consent is required to ramp down, thus avoiding any
adverse effects on the existing consents.

296. The total maximum abstraction rate for all the agricultural and
horticultural applications on the mainstem, is slightly less than 23.5
cumecs. Therefore with a cut-off flow of 152 cumecs the full abstraction
rate of 23.5 is available for all river flows greater than 175.5 cumecs. No
flow sharing is required, so therefore if the flow available for abstraction is
ramped from 23.5 cumecs to 0 between river flows (recorded at the Kurow
recorder) of 175.5 cumecs and 152 cumecs, the residual flow between the
Dam and the sea would be maintained at or above 152 cumecs. Existing
consents could of course lower that residual under present conditions.

297. It is our assessment that such a minimum flow and ramping restriction
would ensure that the maximum rate of abstraction, 23.5 cumecs, would be
available for greater than 98.5% of the entire irrigation seasons for the 26
years of record used by Mr. Scarf because the daily mean flows for the
irrigation seasons for that period fall below 175.5 cumecs for less than
1.5% of the time.

Flow Measurements at the Kurow Recorder

298. Finally under this rather protracted section of this decision we deal with
another matter that arose at the hearing of this application and also at the later
hearing of the Lower Waitaki River applications. This concerned the fact that in terms of the Allocation Plan flows at the Kurow recorder are assessed on 1 hour rolling averages but the irrigators consider this is unworkable for them. We turn to consider that issue now in more detail.

299. The Allocation Plan provides that the flows in the Lower Waitaki River are to be based on measurements at the Kurow recorder and based on one hour rolling averages. Under the current operating management of the Waitaki Dam flows in the River can fluctuate more than 150 cumecs in a 24-hour period.

300. Mr. David Stewart presented evidence at the Lower Waitaki River hearing for individual applicants on the difficulties he believed would be encountered by the irrigators if the cut-off flow was also based on the 1 hour rolling average at the Kurow recorder. The difficulties arose, he said, because the Lower Waitaki River does not have natural flow at any time of the year.

301. He said that in the HDI application, the following was proposed:

A minimum flow for the Lower Waitaki River downstream of the Dam and ramping conditions to ensure that the minimum flow from the Dam to the sea was maintained.

302. Mr Stewart proposed an alternative approach to managing allocation which involved using the daily mean discharge as a method of controlling irrigation takes to ensure the required minimum flow is maintained.

303. Dr David Painter at the later Lower Waitaki River hearing reviewed the evidence of Mr Stewart relating to the difficulties of managing irrigation water supply with hourly-varying water availability and agreed that 24 hours is an effective lower limit on which to base water availability.

304. He examined the effect on transgression of minimum flow requirements of adopting 24-hour, and 72-hour averaging using the Kurow recorded data. He did that for the time period 1 July 1979 to 31 December 2007. This period had the existing river/hydro infrastructure in place and included recent data.

305. Dr Painter found that for a minimum flow of 150 cumecs, using the 24 hour moving mean to determine the flow reduced the transgressions to a third of the transgressions associated with using instantaneous flow measurements and approximately a sixth with a 72 hour moving mean. A transgression was when the flow dropped below the minimum flow if the full abstraction was taken.
306. Dr Painter concluded a change from using "rolling hourly" mean flows to 24-hour moving mean flows for the purpose of determining compliance with a minimum flow regime would be advantageous for existing consent holders as well as new applicants for consents. There would not be a major increased benefit from changing to 72-hour moving mean flows.

307. Mr Potts put forward an alternative concept that he believed was a practical method of imposing irrigation restrictions and this was further traversed at the later hearing for Lower Waitaki River individual irrigation consents.

308. The concept was based on two rolling averages:
   • A 24-hour rolling average to provide trends and to put abstractors on notice that restrictions are possible; and
   • A 6-hour rolling average that triggers the level of restriction.

309. He suggested this concept would operate independently from any input from MEL but was intended to give downstream abstractors some forewarning that restrictions may be imposed - a matter which he saw as desirable to such abstractors.

310. Mr Potts said the 24-hour rolling average presented by David Stewart and Dr Painter appeared to give a reasonable trend of receding river flows without too much noise and seemed to have some acceptance by the irrigators. From his examination of the historical records use of the 24-hour rolling average for compliance would have resulted in some periods of restrictions but would have allowed abstraction in other periods that would also have been restricted had a shorter duration rolling average been used. He said however, the 24-hour rolling average would have been useful in putting abstractors on alert that restrictions were possible.

   a. He said the 24-hour rolling average was just a tool to give warning of a likely restriction in order that abstractors could gear up for some disruption. Actual restrictions would be based on the 6-hour rolling average.

   i. His reasons for adopting the 6-hour figure were:

   ii. It was roughly the time taken for water to flow from the Waitaki Dam to Black Point.
iii. A shorter time step may not result in better protection of the River with fluctuating flows;

iv. The time step more closely mimicked river flows than the 24-hour time step and thus did not result in long periods when the river would be below the minimum without restrictions;

v. The frequency of occurrence (equates to disruption to abstractors), was the same as the 24-hour rolling average for 100 cumece minimum flow; and

vi. It gave a reasonable period of time for abstractors to undertake flow sharing via Water User Groups or switching off some irrigation machinery.

b. Mr Potts acknowledged a 6-hour time scale for abstractors would create some difficulty for them in dealing with the restriction due to the timescale requiring more frequent assessment.

311. Although he agreed with the abstractors' consultants that a 24-hour time step would be desirable in managing their schemes and individual irrigation systems, he said from Dr Painters modelling and the low frequency of occurrence of restrictions being imposed via the 6-hour time step, he did not consider they were sufficiently significant to be unbearable.

312. Mr Potts then described a number of methods by which abstractors could manage their systems using the six and twenty four hour rolling averages. He concluded that the use of a 24-hour rolling average for showing trends and to provide some forewarning to abstractors appeared practical and that the use of a 6-hour rolling average appeared to be a reasonable compromise between practicability of switching irrigation equipment on and off and providing low flow protection to the river.

313. We have considered the problems associated with ensuring that irrigators are not abstracting when the river flow is below the minimum while also ensuring irrigators have sufficient notification to manage their irrigation infrastructure. We have therefore created a band of 23.5 cumece between river flows of 152 cumece and 175.5 cumece which shall be ramped based on the daily mean flow at Kurow for the previous day. The 23.5 cumece would be sufficient to supply all applications on the mainstem of the Lower Waitaki River dealt with at these hearings.

314. The ramping proposed is shown in the following restriction graph and table:
We have concluded from the hydrological evidence and analyses that:

i. the appropriate period of flow record is the shorter one of 1979-2005;
ii. based on that period a reliable water supply can be obtained for HDI with at least 95% reliability but in fact even higher than that and therefore there is no need to have a minimum flow cut-off at 100 cumec;
iii. that to protect existing consent holders the cut-off flow should be 152 cumec with ramping down from 175.5
iv. for the purposes of all new irrigation abstractions granted in terms of this decision and other main stem decisions to come flows at the Kurow recorder are to be based on a 24 hour average of the previous day’s flow.

316. These conclusions will be applied in our overall consideration of this application later in this decision.

Lower Waitaki River - Effects of HDI on Morphology

317. Darryl Hicks is Principal Scientist and Manager of the Sediment Processes Group of the National Institute of Water and Atmospheric Research Ltd (NIWA). He holds a Bachelor of Science degree with first class honours in Geology, a Bachelor of Engineering degree and a Ph.D. degree in Earth Science. His investigations into the geomorphologic impacts of the HDI centred on analysing the effects of the changed flow regime in the coastal reach of the Lower Waitaki River, downstream from the last Irrigation intake point.

318. Dr Hicks said that floods drive the active braiding process by scouring braid beds and banks and depositing new gravel bars. They also help clear riparian vegetation off islands and hinder it from establishing on bars exposed at normal flows. Thus floods are essential for maintaining a dynamic braided river bed. He added that a substantial reduction in flood magnitude, as indexed by the mean annual flood, would render braiding activity less dynamic and would make it easier for riparian vegetation to establish on islands and bars. The net effect would be fewer braids and for channels to stabilise in position and form.

319. Dr Hicks compared the magnitude of the mean annual flood for the various irrigation scenarios together with assessing the effects of the various flow regimes on flood magnitude. The assessments included:

i. The effects on bedload transport and channel substrate. He calculated the bedload transport expected under each flow regime.

ii. The effects on flood management.

iii. The effects on fine sediment accumulation.

iv. The effects on the river mouth specifically mouth closure, outlet location and barrier width.

63
320. Dr Hicks said that the HDI Status Quo mean annual flood in the coastal reach would reduce (from a value of 839 cumecs) by 1.2% with the Existing + HDI regime and by 1.8% with the Full regime. He said the choice of minimum flow made no difference to the mean annual flood value thus none of the various irrigation regimes compared would have significant impact on flood magnitudes and hence on the ability of floods to maintain braiding dynamics. He pointed out that there would be no effect at all if irrigators chose to cease abstraction during floods, which is often done to avoid extracting turbid water and to avoid drawing gravel and sand into the intake structures.

321. From his analysis Dr Hicks said that if the minimum flow was reduced from 150 to 100 cumecs, the average number of braids would drop by less than 1.

**Riverbed vegetation**

322. Because the incidence of floods was independent of irrigation abstraction Dr Hicks pointed out there would be no change in the intermittency of floods among the various irrigation regimes and concluded there would be no significant differences among the various irrigation regimes on the ability of floods to naturally control riparian vegetation.

323. He added, that with a drop in normal flows due to irrigation abstraction, there would be more bank exposed and prone to vegetation growth, thus increasing the area requiring spraying. The Existing + HDI regime would cause a maximum monthly average flow reduction of 18.3 cumecs while the Full regime would cause a maximum monthly average flow reduction of 31.6 cumecs both occurring in February. At the modal HDI Status Quo flow (312 cumecs) these flow reductions represent increases in the width of exposed river bed of 11.8 and 20.6 m, respectively (equivalent to 1.18 and 2.06 ha per km of river length).

324. Dr Hicks expectation was that under the increased irrigation regimes the channels in the coastal reach would de-armour slightly, by increasing the relative proportions of finer gravel. But the subtle adjustment in bed surface texture would likely take some decades to develop along the coastal reach. Thus, he concluded that neither irrigation scenario the HDI or the Full (90cumecs) would have a significant effect on bed load flux or substrate size in the coastal reach.

325. Dr Hicks said that the reduced flows due to the increased irrigation abstractions should slightly increase the trap efficiency of fine sediment in the coastal reach. No relationship exists to quantify this. However, he expected that
the coastal reach will be less prone to fine sediment deposition compared to the river upstream from Stonewall since the fine sediment sources (mainly the tributaries) are well upstream and some of this suspended load will be filtered out before the coastal reach. Proposed flushing flow releases to clear fine sediment from the reach between Waitaki Dam and Stonewall would also flush the coastal reach. He concluded that fine sediment accumulation was unlikely to be a significant factor in the coastal reach under the increased irrigation regimes, particularly if flushing flows are released from Waitaki Dam. He also concluded that the regimes considered would not have a significant effect on gravel storage volumes and barrier width at the river mouth.

River mouth

326. With regard to the issue of river mouth closure, records of river mouth closure events at other sand and gravel rivers in Canterbury and Southland (Ashturton, Rangitata, Ophihi, Waiau in Southland) show that these events all occurred during prolonged periods when the river flows were 30 cusecs or less.

327. The only information Dr Hicks found of a closure event at the Lower Waitaki River mouth stems from Maori oral history, as provided by the late Mr K Davis. That listed a closure sometime in the mid 1800s. True closure (as against a restricted, well-northward-offset mouth as occurred in the late 1970s and as was re-centred by excavation) has not been documented over the past century.

328. Since 1979, when the river has been operated under its current, regime. Dr Hicks said the lowest post 1979 daily mean discharge from the Waitaki Dam had been 62 cusecs (an event lasting for one day only on 12 July 1985).

329. Dr Hicks concluded that the minimum flows associated with HDI or a regime with the full Allocation Plan irrigation allocation should, if anything, lessen the already very low risk of closure at the River mouth. He added that a regime with a minimum flow of 100 cusecs would have carried a slightly higher risk than one with a 150 cusecs minimum.

330. Dr Hicks concluded that the HDI should not have any significant effect on the tendency for northward mouth migration. He did however qualify his conclusion by saying that:

331. It was based on the assumption that the HDI Status Quo regime, as he used it, continued to represent the way that floods and freshes originating in the Upper
Waitaki catchment were controlled. This acknowledged a concern raised in the submission of Diana and Mark Taylor.

332. The processes associated with the northward mouth offset phenomenon are only qualitatively and partially appreciated, thus the possibility cannot be excluded that flow reductions at the mouth associated with irrigation extractions might have some effects. For this reason he recommended that the lagoon outlet location and lagoon levels be monitored on an ongoing basis. This information would then be available for consent reviews.

333. Similarly, since Dr Hicks expected no significant lasting effects of the increased irrigation regime on bed load transport through the coastal reach of the Lower Waitaki River, he concluded that this regime will not significantly affect coastal erosion on the Morven-Glenavy coast and sea-flooding and barrier retreat on the Waihao-Wainono barrier. This addressed further concerns raised in the submissions of William Stevens and Diana and Mark Taylor.

334. It was Dr Hicks view that HDI and NBTC schemes would have no significant compounding geomorphic effects. While NBTC may tend to increase armouring of the bed of the coastal reach, HDI should tend to decrease armouring there, thus the net effect on bed texture should be minimised with the two schemes operating.

Monitoring and mitigation

335. Dr Hicks recognised the incomplete state of knowledge of the link between river flows and mouth outlet location, so he recommended a condition whereby the outlet location and lagoon levels are monitored, with this information being used to reassess effects on the river mouth during future consent reviews.

336. Dr Hicks was aware that should NBTC proceed, then MEL has agreed to fund spraying of gorse and broom along the whole length of river between Kurow and the coast. He suggested that this measure would mitigate the HDI effects on vegetation encroachment.

337. Mr & Mrs Taylor considered the proposal for a minimum flow of 100 cumeecs would create problems at their farm property on the south side of the Lower Waitaki River mouth, similar they believed to the impacts that may arise from NBTC. Mrs Taylor said that HDI like NBTC would reduce the volume of water through the
mouth and existing problems of a northwards migrating mouth which she believed had been accentuated over the past six months by low flows of 200 cumecs or less.

338. Mr and Mrs Taylor did not agree that HDI with a minimum flow of 100 cumecs would not impact on the problem with the mouth. They said that the mouth may not close but would become so restricted it would not be able to release sufficient water into the sea fast enough, thus backing up and ponding.

339. Mr & Mrs Taylor thought that the minimum flow proposed would impact on the natural flow of the River to the sea. The low flows have created a narrow channel to the mouth, which they maintain would not be able to handle the increased summer volume brought about by irrigation water returning to the river, through drains on their property, let alone any possible flushing flows or floods.

340. Mrs Taylor also said that they were aware of the Scheme creating a fund to promote environmental projects but were unaware of any proposal for the Scheme contributing to the maintenance and well being of the residual river, its bed and banks.

341. Mr & Mrs Taylor were concerned that because of abstraction, there will be more river bed area available for weeds to grow, requiring more spraying and who would bear the cost of the increased spraying needed to control those weeds?

342. Ian Heslop is the Design & Operations Engineer with the Engineering Section of Environment Canterbury. He holds a Bachelor of Engineering (Agricultural) and is a Chartered Professional Engineer. He has 27 years professional work experience mainly in flood protection and drainage.

355. Mr Heslop was concerned that at the HDI intake on the Lower Waitaki River, construction and maintenance of the diversion race could:

356. Weaken river bank and berm protective plantings.

357. Increase the risk of berm erosion and river course change towards the intake structure.

358. Increase bank and berm planting maintenance and flood damage restoration costs; and,

359. Place liability on Environment Canterbury, and the Lower Waitaki rating district, in the event of flood damage to the diversion race or intake structure.
360. He had discussed his concerns with both Brian Ellwood and Walter Lewthwaite. His understanding was that they would address those matters in consultation with the Regional Engineer, as part of the preliminary design work for the land-use consent applications that had to be applied for before implementation of the project.

361. He accepted Walter Lewthwaite's evidence that these issues could be addressed appropriately through the land-use consenting process.

Conclusions

362. The possibility cannot be excluded that flow reductions at the mouth might have some adverse effects on the northward mouth offset phenomenon. But we do not think this will arise as a result of the HDI scheme abstraction particularly as we have now decided to retain the Allocation Plan's environmental flow regime for the Lower Waitaki River, that is designed to ensure this does not happen.

363. On Dr Hicks recommendations for monitoring in this regard, based on the conclusion just reached, we see no need for such monitoring in terms of this consent.

364. Flooding of low ground adjacent to the mouth is a concern. Both the mouth offset and possible closure due to prolonged low flow have the potential to exacerbate the risk of flooding of that low land all be it slight. Adopting the 150 cumececs cut-off flow will both provide the reliability of water supply for new consent holders the Plan requires and avoid creating the flow conditions at the mouth that can cause mouth closure.

365. Braiding is flow dependent and there is likely to be one less braid at 100 cumececs compared with 150 cumececs. Evidence presented at the NBTC hearing indicated that the predominance of recreational use of the Lower Waitaki River is within the Black Point to the sea reach. The loss of a further braid in that reach would in our opinion be undesirable. Hence our decision to maintain the Allocation Plan's minimum flow will be beneficial to the River.

366. Mr & Mrs Taylor's concern regarding mouth closure has been addressed by adopting the Allocation Plan 150 cumececs cut-off flow.
367. Overall therefore, it is unlikely there will be any adverse hydrological effects brought about by the abstraction of 20.5 cumecs from the Lower Waitaki River for the purposes of the HDI scheme.

368. Effects on Hydrogeology Adjacent to the Lower Waitaki River

369. Ian Ronald Fraser is the Principal Hydrogeologist and Regional Manager Christchurch with URS New Zealand Limited since 1990. He holds a Masters of Science in Geology and a Post Graduate Diploma in Business. Mr Fraser described the surface deposits of the Lower Waitaki River as characterised by the modern day floodplain deposits of gravel, sands, and silt bordering and interacting directly with the river. These deposits he said are generally confined in their spatial extent to 2-3 km either side of the braided river system, with the river having incised into older Pleistocene gravel deposits. With distance from the river the Waitaki Fan surface rises in a stepwise fashion, with the terraces demarking past glacial and interglacial episodes of deposition and erosion. The Pleistocene deposits form the majority of the Waitaki Fan surface, with loess deposits becoming more prevalent with distance from the River.

370. Based on the groundwater investigations carried out to date, Mr Fraser, said that the hydraulic gradient of the shallow groundwater system below Black Point indicates that flow generally occurs towards the River. However, with distance downstream from Black Point the groundwater flow tends to be parallel to the River, flowing towards the coast. It is at the edges of the terraces immediately adjacent to the floodplain deposits, where the direction of flow is still towards the River.

371. Mr Fraser said that the strongest relationship between water levels in the River and groundwater levels was in the alluvial deposits of the present day floodplain. Springs and wetlands adjacent to the River have the potential to experience the same water level relationship. However with distance from the River, the response of groundwater in the Post-Glacial gravels to changes in river levels was expected to become progressively more subdued and delayed. Furthermore, the widespread use of border dyke irrigation on the Pleistocene terraces downstream of Black Point was expected to be the primary mechanism influencing groundwater levels. He said that the influence of border dyke irrigation and associated drainage on wetlands located adjacent to the Pleistocene terraces is clearly apparent in water level monitoring.
372. Groundwater levels recorded in shallow wells installed on the Pleistocene terraces on both sides of the River exhibit similar seasonal trends, with summer water levels being higher than winter water levels. The trend of summer highs and winter lows in water levels are in Mr Fraser's opinion directly associated with the border dyke irrigation of the terraces and leakage from the associated races.

373. Mr Fraser assessed the effects of the proposed HDI abstraction on the groundwater resources and associated features downstream of Stonewall. He used the five irrigation scenarios:

i. HDI Status Quo with existing irrigation takes (i.e., up to a maximum of 56 cumeecs) and the smallest existing consented minimum flow of 80 cumeecs (HDI Status Quo);

ii. Existing irrigation including an allowance for non-irrigation takes plus HDI (i.e., 56 + 20.5 cumeecs) with 150 cumeecs minimum (HDI 150 Existing+HDI);

iii. HDI full irrigation uptake (i.e., 90 cumeecs) including an allowance for non-irrigation takes with 150 cumeecs minimum flow (HDI 150 Full);

iv. Existing irrigation including an allowance for non-irrigation takes plus HDI (i.e., 56 + 20.5 cumeecs) with 100 cumeecs minimum (HDI 100 Existing+HDI); and

v. HDI full irrigation uptake (i.e., 90 cumeecs) including an allowance for non-irrigation takes with 100 cumeecs minimum flow (HDI 100 Full).

374. The stage height to flow relationship derived from the 2001 Low Flow Trial (0.185 m/100 cumeecs) indicated that the difference in flow between potential low flow scenarios and the abstraction rate being applied for under the HDI will result in relatively small changes in river stage height. He said that groundwater level changes of the order of 9cm, irrespective of their frequency, are not expected to result in any significant effect on the groundwater resources of the Lower Waitaki River or its associated features such as springs, spring fed streams, terrace wetlands and groundwater supplies. Furthermore, due to the expected buffering effect provided by drainage from the border dyke irrigation systems any potential reduction in groundwater levels was expected to be limited to beneath the current floodplain of the River within the Post Glacial Gravels.
Conclusion

375. The stage height to flow relationship derived from the 2001 Low Flow Trial indicates that the lowering of the adjacent groundwater level from the HDI abstraction is approximately 3 – 4 cms. The abstraction of water for the HDI scheme therefore will have a minimal effect on the adjacent groundwater levels.

Effects on Ecology and Water Quality

376. The aquatic ecological effects associated with HDI can be divided into those effects associated with the Lower Waiake River and those associated with water bodies within the HDI command area. We deal with the Lower Waiake River first.

Lower Waiake River effects

Effects on flows

377. The primary effects of the HDI on the Lower Waiake River revolve around potential effects on the River’s instream habitat and water quality which may come about from changes to the flow regime associated with abstraction. In general, abstractions from the Lower Waiake River act to reduce the flow although this can vary with distance down the River and the seasonal demands of irrigation. Mr Jowett noted that irrigation abstractions have the greatest effect on river flow in the section of river below the last abstraction point (Bell’s Pond - about 2 km above Ferry Road).

378. Mr Jowett used a long-term modelled flow record (July 1931-June 2004) and seasonally distributed abstractions to calculate the difference that HDI abstractions made to the existing flow regime of the Lower Waiake River. He assumed that abstractive demands would vary over the season, with peak demand in February and minimum demand in winter.

379. We note at this point that Mr Jowett’s analyses of the proportion of time at which the River is at a particular flow, and his subsequent analyses of the proportion of time factors such as river wetted width and instream habitat are reduced with flow, are based on the hydrological analyses primarily of Mr Henderson which we have already discussed above and rejected in favour of the shorter record (1979-2005) recommended by Mr Scarf. For that reason, estimates of low flow occurrence and species’ habitat loss made by Mr Jowett, and also assessments of the effects of in-stream habitat availability made by
other witnesses who relied on Mr Henderson's and Mr Jowett's analyses, may differ from that presented in their evidence and discussed at the hearing. We think that by and large such differences will be minor and on the whole effects on loss of in-stream habitat will be less than stated.

380. HDI witnesses made a series of assessments of the HDI take in relation to various flow regimes (status quo, minimum flow of 150 cumecs, minimum flow of 100 cumecs, with and without full irrigation allocation taken up). We have already determined that the minimum flow in the Lower Waitaki River with respect to this application is to be 150 cumecs, in keeping with the Allocation Plan. Therefore, we need only concern ourselves with the effects of the HDI abstraction in that context.

381. Mr Jowett concluded that the additional abstraction of the HDI would not change the Lower Waitaki River's flow regime significantly. He found that, when comparing the flows modelled for existing takes and existing takes plus HDI with a minimum river flow of 150 cumecs, in both cases the additional irrigation would reduce the 7-day mean annual low flow (the MALF) by 3%, from 168 cumecs to 163 cumecs.

382. Mr Jowett then modelled the effects of HDI on river flows assuming that the allocation limit of 90 cumecs is fully taken up and the river minimum flow is 150 cumecs and found flows were at 150 cumecs for 7% of the time.

383. Under the Allocation Plan's 150 cumecs minimum flow, flows would be 150 cumecs for 6.1 days per season. With a 150 cumecs minimum, the flow would be at 150 cumecs at some time during 79% of peak salmon seasons.

Riverbed vegetation

384. Ms Diana Robertson presented evidence on behalf of HDI relating to terrestrial ecology and wetlands.

385. She described how the riverbed vegetation in the Lower Waitaki River is largely driven by exotic plant invasion, vegetation management works (willow control, planting and layering), grazing patterns and river flows. Willows and shrub lands of gorse and broom dominate the river margin, with smaller areas of native as well as exotic herbaceous vegetation. Crack willow trees are extensive along both banks and are scattered over the riverbed, between braids and on old river courses. Gorse and broom shrub lands also occupy large areas of the
stable riverbed and are not specifically controlled under the current vegetation management programme.

386. Native vegetation on the Lower Waitaki River has decreased and is continuing to decrease as a result of invasion of exotic species. Native wetland species occur occasionally under the willows on the river banks.

387. Ms Robertson described the overall trend in vegetation pattern over the last 70 years as one of increasing tall and shrubby exotic vegetation (mainly willows, gorse and broom) and decreasing gravels. Based on analysis from aerial photos, the amount of low and tall vegetation has increased since 1936 from an average of 112 to 655 metres width across the floodplain, while bare gravel has decreased from an average width of 380 to 133 metres. This pattern has continued despite the vegetation management work carried out by the Regional Council. With similar vegetation and river flow management, Ms Robertson concluded that vegetation is likely to continue to encroach onto bare or sparsely vegetated gravels, further decreasing these areas.

388. Ms Robertson made the important comment that there is a potential for a ‘slight’ increase in vegetation encroachment with increased abstractions irrespective of minimum flows.

Wetlands

389. Ms Robertson identified 3 distinct wetland types within the Lower Waitaki River study area: riparian wetlands, river terrace wetlands and estuarine wetlands. She described them as follows:

390. The riparian wetlands are adjacent to the River, between the cleared fairway and intensively managed farm land, and have at least periodic surface inflows from the River. Ms Robertson considered that while the riparian area is a substantial part of the Lower Waitaki River, the riparian wetlands are a relatively minor spatial component of this area. The water levels in the riparian wetlands are influenced largely by the River, but also by adjacent irrigation, tributaries and springs. The vegetation in these wetlands is generally species adapted to fluctuating water levels and dominated by exotic species. Native species include occasional stands of raupo, sedges and rushes on wetland margins and macrophytes. The riparian areas also provide habitat for eel, mudfish and bully and wetland bird species.
391. Between Stonewall and the sea there are approximately 130 ha of terrace wetlands. These lie away from the river edge and do not have surface water inflows from the River. They are supplied with water from a range of sources including springs, groundwater and small streams. Willow, gorse and broom are the most frequently occurring vegetation cover in discrete terrace wetlands, but are not as dominant in individual terrace wetlands as they are in riparian wetlands.

392. The terrace wetlands provide additional habitat for many of the braided river birds as well as for birds preferring wetland habitats. Similar fish species as those found in riparian wetlands are found in the terrace wetlands with species occurrence affected by connectivity to the river and habitat within the wetlands.

393. Estuarine wetlands are those adjacent to the mouth of the river and are influenced by coastal processes and, in this case, low salinity conditions.

394. Ms Robertson noted how existing threats to wetlands of the Lower Waitaki River relate to land development for agriculture and the invasion of exotic species in particular crack willow.

395. In assessing the significance of these wetlands, Ms Robertson used the general methodology and associated guidance in the proposed NRRP, Chapter 7, Appendix WTL1, but with some variations. She considered the highest value wetlands are those with abundant wetland plants, which provide physical habitat diversity for periphyton, macroinvertebrates, birds and fish, and those with at least intermittent connectivity to the River.

396. The potential effects of HDI on wetlands was assessed by Ms Robertson in terms of how flows may influence wetland ecology. In terms of floods, she concluded that there is no significant difference in flood size with the different irrigation flow regimes. The role of the River flood flows in flushing wetlands or providing temporary connectivity is therefore not expected to change.

397. Flow variability would continue to be high under any of the irrigation flow regimes canvassed by MEL witnesses.

398. HDI with 150 cumecs (and full allocation) would decrease the median flow of the River to 303 cumecs.
399. Under low flows, Ms Roberston stated that wetlands will be affected differently in relation to their depths. Some wetlands, or parts of wetlands, will still be deep at 150 cmmecs, while others will be shallow and some will be dry.

400. Ms Roberston concluded that these temporal changes in wetland depth are not expected to affect the overall condition, composition and functioning of wetlands, as the plant species present are species that tolerate fluctuating water levels, are dominated by willows, and are expected to remain under the scenario of generally lower water levels. The increase in frequency and duration of dry conditions may stress plants at their hydrological limit but she did not expect this to cause a change in the wetland composition.

401. Ms Robertson deferred to Dr Jellyman for effects on the Canterbury mudfish in the vicinity of Welcome Stream. It was considered that these wetlands with mudfish appear to be at least partially fed by spring water and not entirely driven by water level changes in the Lower Waitaki River and therefore may still retain water at low flows. Dr Jellyman noted that mudfish can withstand dewatering by burrowing into the substrate where they can survive as long as they are kept moist.

402. Terrace wetlands are not expected to be adversely affected under HDI because their hydrology is driven more by springs and irrigation. The changes in the river flows therefore have a lesser effect on these wetlands' hydrology than the riparian wetlands. Springs, irrigation water and tides also contribute to the hydrology of estuary wetlands thereby tempering any effects of changes in the River's flow regime.

403. Ms Robertson considered that some riparian wetlands and terrace and estuary wetlands will be buffered from flow regime differences by irrigation, spring water and tides and are therefore less affected by differences between regimes.

404. In terms of mitigation of the effects of HDI, Ms Robertson recommended specific vegetation clearance on 2 or 3 islands with protective flows around them, to enhance the habitat for white-fronted tern, black-billed gull and black-fronted tern breeding colonies. She also recommended investigating options and undertaking works to protect and enhance the mudfish habitat in the vicinity of Welcome Stream, and monitoring water levels in the mudfish wetlands, as recommended by Dr Jellyman.
405. We note that MEL, under its NBTC consents, is required to provide for vegetation clearance and wetland management associated with the Lower Waitaki River.

406. Mr Neal Deans, Manager of the Nelson Marlborough Fish and Game Council, gave evidence on behalf of Fish and Game in relation to wetlands. He noted that the issues associated with HDI were similar to those associated with NBTC, except that the quantum of the water taken is considerably less compared to that which remains.

407. He was of the view that it was difficult to estimate the effect of the HDI abstraction on wetlands adjacent to and influenced by the Lower Waitaki River and he did not provide much in the way of an analysis of the effects of HDI in relation to a 150 cusecs minimum flow.

408. Dr Ruth Bartlett, a terrestrial ecologist witness on behalf of local Runanga and Te Runanga o Ngai Tahu, considered that the evidence presented by Ms Robertson was insufficient to establish that the effect on the riparian environment of the HDI flow regime over a 35 year period would be minor. She was concerned that proposed monitoring by HDI did not specifically include any areas in the Lower Waitaki River apart from water level monitoring at the river mouth. Proposed mitigation in the form of vegetation clearance did not state how much vegetation clearance would be undertaken and she considered that this needs to be specified.

**Intake Location**

409. Ms Robertson noted that the intake site is part of the "Waitaki River" Site of Natural Significance in the Waimate District Plan. This site covers the full length of the River from the Waitaki Dam to the mouth and is noted in the Plan for its bird and fish values. She did not consider the wetland to be significant based on the criteria specified in the proposed NRRP. She said it has value for waterfowl and native fish in association with the wider existing irrigation intake channels and head pond, but given its recent formation, predominance of exotic vegetation, lack of rare species and presence of similar habitat in the vicinity, she did not consider it significant.

410. Apparently several mahika kai sites have been recorded in the vicinity of Stonewall for several kilometres along the north bank of the Lower Waitaki River. The intake is within a mahika kai site called Rakaitu – Stonewall. The historical
values of Rakaitu – Stonewall include a settlement and gathering of birds and eel. Ms Robertson recommended that intake works avoid this site. She also suggested that there is potential to enhance wetland values in the area at the time of any intake construction works. She recommend further discussions with the local runanga if the HDI proposal proceeds.

411. Dr Robert Jessop was the author of a report on terrestrial ecology appended to the section 42A report.

412. His report stated the assessment of ecological effects for the HDI 20.5 cumecs take on the Lower Waitaki River environment was largely based on the results of hydrological modelling undertaken by NIWA and summarised his conclusions as follows:

"Given the magnitude of the flow change (approximately 5% of the mean flow) and the variability in flows in the Lower Waitaki River within and between years, the change in areas of suitable habitat will have no discernable ecological effect. The relative magnitudes of these average habitat changes (i.e., 0.5-3%), and therefore the conclusions about ecological effects, would remain virtually the same whether the 20.5 cumecs was taken on top of the currently consented 56 cumecs, or on top of the anticipated future consented 69.5 cumecs, or whether the minimum flow was 150 or 100 cumecs."

413. He also reported that subsequently in the AEE section 6.3.4, adverse effects on terrestrial ecology were summarised as follows:

"Potential effects of reduced flow on terrestrial ecological and wetland values relate to predator access to braided river bird colonies, weed encroachment on the braided river islands and reduced water levels in wetlands. The relatively minor changes in river flow associated with this individual abstraction are not expected to create any discernible difference in these aspects and therefore have a no more than minor adverse environmental effect."

414. Dr Jessop’s concern was that given those conclusions about ecological effects, it would appear the applicant considered that further investigation into adverse effects on the terrestrial environment was unnecessary and no further ecological information was presented. He stated in his report that with all predictions based on a model, there is a level of uncertainty and that uncertainty and its implications on the biological environment were not discussed in the AEE.
Dr Jessop’s recommendation was that should the eventual water levels and flows not match those predicted, and mitigation required, procedures be put in place to ensure that happened. Dr Jessop was aware that the applicant had proposed a condition for such an eventuality, but considered the condition very general. He suggested some form of adaptive management may be appropriate.

Conclusions

We conclude that, in isolation, the effects of the HDI take on wetland habitat associated with the Lower Waitaki River are less than minor. We are satisfied that a reduction of flow in the order of 20.5 cumecs would result in a small reduction in river water level and consequently small reductions in riparian wetland water levels can be anticipated. We note some concern regarding the Welcome Stream wetland area, as this area provides significant habitat for the Canterbury mudfish, an at risk species subject to considerable pressure through land use development. However, we are satisfied that a minimum river flow of 150 cumecs will ensure that effects on this species are unlikely to occur in the Welcome Stream area. We note that the Allocation Board recorded that it had found that habitat requirements are generally well provided for if flows are between 80 and 250 cubic metres per second, and that connectedness to riparian margins, wetlands and backwaters requires flows of at least 150 cumecs.

Effects on water quality

Mr Edward Norton presented evidence on water quality on behalf of HDI. He noted that water quality is generally high at the Waitaki Dam but deteriorates with distance downstream. Nutrients such as bio-available nitrogen (for plant and algae growth) are relatively low in concentration at Stonewall but significantly higher at the State Highway 1 Bridge. Inputs from tributaries, groundwater, re-suspension and erosion of sediments, and probably stock and bird colonies along the river all contribute to downstream increases in contaminant concentrations.

Mr Norton described how abstraction reduces the capacity of the river to dilute contaminants that enter the lower reaches. He estimated that, at worst, during the peak of the irrigation season (January-February), the combined 90 cumecs takes constitute approximately a 26% reduction in median dilution capacity, of which 16% is the result of existing abstractions, 6% is attributable to
the HDI take and the remaining 4% to other new takes. The effect is smaller during the shoulder period of the irrigation season (October and March) and negligible outside of the irrigation season when the only small takes are for stock water and town water supplies.

419. Reduced dilution capacity would increase contaminant concentrations and the risk of breaching water quality guidelines, particularly for bio-available nutrients (i.e., dissolved inorganic nitrogen or ‘DIN’ and dissolved reactive phosphorus or ‘DRP’) and for microbiological indicators such as Escherichia coli (E. coli). In order to quantify this risk, he assumed that catchment contaminant loads and nutrient input and exchange processes remain constant in future.

420. He compared estimated concentrations with the Ministry for the Environment’s New Zealand periphyton guidelines for bio-available nutrients and with the Ministry for the Environment – Ministry of Health microbiological water quality guidelines for E. coli. He found that existing median DIN and DRP concentrations at Stonewall are low and currently meet periphyton guidelines for nutrients. Immediately below the proposed HDI intake location at Stonewall, the concentrations would be unchanged and guidelines would still be met. The effect of reduced dilution would only appear further downstream as nutrient loads increase.

421. At the SH1 bridge, existing median DIN and DRP concentrations are higher and do not currently meet periphyton guidelines for nutrients. New abstractions of 34 cumeecs (including the 20.5 cumeecs HDI take) would increase DIN and DRP concentrations slightly further above guidelines.

422. Existing 95th percentile E. coli concentrations over the 2006/07 summer-autumn period met a Suitability for Recreation Grade (SfRG) of ‘fair-poor’ at Stonewall and ‘poor-very poor’ at SH1 Bridge. New abstractions of a further 34 cumeecs (including the 20.5 cumeecs HDI take) would increase 95th percentile E. coli concentrations slightly at SH1 Bridge, but the grade would remain ‘fair-poor’ at Stonewall and ‘poor-very poor’ at SH1 Bridge.

423. Mr Norton found that overall, the abstractions reduce water quality by pushing nutrient and E. coli concentrations a little further above guideline levels at SH1 Bridge. The consequence of this is to incrementally increase the risk of nuisance periphyton growths and the risk of illness through contact recreation in the River to a minor extent.
Generally, he expected the Lower Waitaki River (downstream of the combined 90 cumec irrigation takes) to meet the water quality outcomes described in Objective WQL1.1 (including Table WQL5) and standards in Schedule WQL1 of the proposed NRRP, with the exception of the microbiological standard for contact recreation, and occasional nuisance periphyton growths during dry summers. These latter two exceptions also apply to the status quo situation, but would be slightly exacerbated by increased abstractions.

Mr Norton considered that the best mitigation for the effects he described above (other than avoiding flow reductions) is the catchment-wide reduction of contaminants. He interpreted this as managing land-uses that are not related to the use of HDI water, because HDI water will be used to irrigate land to the north of the River that does not drain significantly to the Lower Waitaki River. The exception to this is a relatively small area of Elephant Hill which has approximately 1000 ha within the Scheme area and drains to the River.

Mr Norton noted that the applicants have committed to using ‘Best Management Practices’ (BMPs) to manage all land under their control MEL has proposed, as part of the NBTC proposal, to promote BMP measures to other land and water managers and to assist by contributing to a water quality monitoring framework for the Lower Waitaki River Catchment. This would include monitoring for a range of contaminants including nutrients and micro-organisms, and reporting the results for indicators of water-contact recreation risk (e.g., E. coli) to the Regional Council so that these may be posted on their website along with other recreational bathing sites in the region.

Mr Norton went on to say that the actions and monitoring MEL has proposed for the NBTC would also serve to partially mitigate for the reduced dilution effects of the HDI take if granted.

He said that flushing flows are another potential option for mitigating nuisance periphyton growths, and these are discussed below as they relate to effects on periphyton and Didymo.

Several submitters expressed concern about the potential effects of reduced flows on water quality. The Lower Waitaki River Management Society Inc., through presentations by its Chairman Mr Bill Penno and member Mr Dugald McTavish, sought that we only consider granting HDI consent if it complied with the Allocation Plan and that the Waitaki Dam resource consents were included in
the application. We are unable to consider the latter request but as to the former as we have said earlier we have decided that the HDI proposal should comply with the Plan as regards the minimum environmental flow of 150 cumecs.

430. The case on behalf of Te Runanga o Ngai Tahu and local Runanga included evidence from Dr Brian Coffey on water quality effects. Dr Coffey's presentation was largely a summary of the evidence and AEE findings presented by HDI's witnesses and provided no new information. Understandably he focused mainly on the effect of HDI in the context of a 100 cumecs minimum flow and made little comment about water quality with a 150 cumecs minimum flow.

Conclusion

431. We are satisfied that a minimum flow of 150 cumecs will keep contaminant concentrations to an acceptable level in the Lower Waitaki River downstream of Stonewall. With a full allocation of 90 cumecs and a 150 cumecs minimum flow, the Lower Waitaki River is likely to meet water quality outcomes described in Objective WQL1.1 (including Table WQL5) and standards in Schedule WQL1 of the proposed NRRP except possibly in very dry summer situations. We accept Mr Norton's view that land-use management is an appropriate tool for minimising the risk of contaminant concentrations exceeding water quality guidelines, but we also accept and agree with Dr Coffey's point that HDI has limited influence only on land use management practices within the lower Waitaki River Catchment, and there is uncertainty around whether mitigation in the form of improved land use management practices can be expected when they are essentially of a voluntary nature.

432. We are also satisfied that a minimum flow of 150 cumecs will maintain general water quality conditions of the type sought by other users of Lower Waitaki River water, including Sanford's salmon hatchery operation at Ikawai.

Effects of the HDI abstraction on Lower Waitaki River instream habitat

433. Mr Jowett described the methods he used to assess the effects of the Lower Waitaki River flow regime on aquatic biota. Principally these revolved around the Instream Flow Incremental Methodology or IFIM. He carried out a habitat survey in 2001 during managed flows to avoid any extrapolation and minimise errors in predicted water levels. The representative reaches (Ferry Road and Priest Road)
were surveyed at flows of 350, 150, 120 and 85 cumeecs. Mr Jowett made the point that the model predictions of habitat change were based on hydraulic measurements taken at the actual flows of concern and so there is "little likelihood of error" in this aspect of the method.

434. Mr Jowett acknowledged that while the IFIM methodology had been subject to considerable debate and controversy, he noted it to be the method of choice for setting managed flow regimes and, in his own considerable experience with its use in New Zealand river systems, he found that it generally achieved objectives of sustaining or improving aquatic biota. He gave examples in support of this statement.

435. With respect to effects on existing in stream habitat, Mr Jowett found that IFIM modelling predicted that the reduction in median flow caused by HDI reduces the water surface width by 2.9 m (1%), the average depth by 4mm and velocity by 0.01 m/s. He considered the worst case to be when existing abstractions reduce the flow to 170.5 cumeecs and the additional HDI take of 20.5 cumeecs reduces flow to the minimum of 150 cumeecs. This resulted in a predicted average loss of habitat for fish and invertebrate species of 6.4%, which ranged from 18.5% habitat loss for common bullies to a gain of 5.1% in adult brown trout habitat. He noted that this situation would be infrequent (7% of the time).

436. We again note that Mr Jowett's estimates of frequency of time habitat availability at 150 cumeecs are likely to be an overestimate given the shorter flow record and the ramping regime we have adopted for this decision.

437. Mr Jowett noted that trout and salmon spawning occurs in winter and salmonid rearing is mostly in spring, and these were unlikely to be affected by minimum flows caused by water abstraction for irrigation. Also, activities such as salmon angling occur in January to April (peaking in February and March) and the peak salmon angling period therefore overlaps the tail of the period when minimum flows normally occur.

438. The issue of the effects of prolonged low flows was considered by Mr Jowett in his evidence. He concluded that it was unlikely that minimum flows that persist for three or so weeks each season would have any detrimental effect on aquatic organisms given the small change for a short time, although he acknowledged that these could result in localised displacement and perhaps some mortality to fish or benthic invertebrates.
439. In very dry seasons, low flows could persist for up to 120 days and this duration of low flow is sufficient to result in reductions in native fish and salmonid populations.

440. Mr Jowett concluded that fast water native fish species (torrentfish and bluegill bulies) would be most affected, but in general native fish populations would recover in the following season with recruitment from the sea. Adult brown trout habitat would increase, but experience a reduction in food supply which could either reduce the adult trout population or reduce the condition of the trout. Less is known about the effects of low flows on adult rainbow trout or juvenile salmon, but the loss of habitat and reduction in food supply might affect these species, and the recovery time would be about 3 years. These and other matters are addressed in more detail under separate headings.

Periphyton

441. Using the habitat modelling undertaken by Mr Jowett, Mr Norton found that the worst case effect on periphyton habitat is when the HDI abstraction reduces flows from 170.5 down to 150 cusecs. This flow scenario reduces the physical habitat for ecologically favourable diatom species by around 5%, by 9% for the less favourable short filamentous algae and by around 11% for potentially nuisance long filamentous algae. He considered these reductions in the area of suitable habitat to be small and occur infrequently (i.e., approximately 7% of time). We note again that with a shorter flow record and the ramping regime we have adopted these reductions may be overstated.

442. Mr Norton described how his analysis determined that in average years, where the median duration of low flow events will increase from 9 days (HDI Status Quo) to 18 days (days equal or less than 150 cusecs under HDI with full allocation), there would be a theoretical increase in the risk of nuisance growths, although not to the extent that it would be discernible to the 'casual observer'. In dry years, nuisance growths could potentially be noticeable to regular river visitors (e.g., anglers and jet-boaters) and the increase would be measurable in biomass terms. Mr Norton considered that at these times growths could exceed the biomass outcome in Objective WQL1 (Table WQL5) of the proposed NRRP, in small side braids and large braid margins.

443. With respect to Didymosphenia geminata (dymo), Mr Norton concluded that increased water abstraction during low flow periods would increase its
growth rate due to the cumulative of increased flow stability and nutrient concentration, and favourable light and temperature conditions. The effect would only be measurable in areas where didymo is not already established as a mature mat, such as those subject to some recent hydrological or other form of bed disturbance.

444. Mr Norton also considered that under low flow conditions, didymo could be more susceptible to snagging anglers lures, and entering jet-boat engine intakes in small braids and at the margins of main braids. However, he stated that surveys show there will still be main channels with sufficiently deep flow that jet boats could navigate without the engine intake passing close to didymo on the bed.

Effects of didymo on HDI fish screens

445. In terms of screening the HDI intake for fish, Mr Norton concluded that the presence of didymo in the Lower Waitaki River will present challenges for the design of an intake fish screen. Clumps of didymo carried by the river flow will tend to clog fine mesh screens, requiring engineering solutions to this problem.

Mitigation for effects on periphyton (including didymo)

446. Mr Norton concluded that the most practical option for mitigating nuisance periphyton growths in rivers with managed flow regimes is flushing flows. He noted that HDI in itself was not capable of generating a flushing flow of sufficient magnitude to remove periphyton from the bed of the Lower Waitaki River (i.e., by closing its intake and so providing an additional 20.5 cumecs of water to the River). Flushing flows are provided for in the Allocation Plan and have been incorporated into NBTC consent conditions.

Conclusion

447. We are satisfied that HDI will have a less than minor effect on promoting nuisance algal growths in the Lower Waitaki River. Nuisance growth events are predicted to occur approximately 1 year in 15 and we do not see this being significant given such growths are temporary and their effects are relatively short-lived.

448. Periphyton growths in the Lower Waitaki River are now dominated by the invasive didymo diatom. We have heard evidence at this hearing and at the NBTC hearing that didymo is a fast growing species and is difficult to
remove from the bed of the River. Even under the status quo flows where the median flow is approximately 365 cumeecs, its growth is prolific. It can also grow to nuisance levels in quite low nutrient conditions.

449. We have concluded that HDI of itself will not significantly increase the risk for didymo to spread its cover or its nuisance effect in the Lower Waitaki River. HDI will have some effect on reducing the dilution of nutrients and reducing the depth and velocity of the water, but these effects are minor.

450. Concern was expressed by the Central South Island Fish & Game Council (Mr Mark Webb) about the effects of HDI, in combination with low river flows, on didymo and its effects on angling, but we consider maintaining a minimum flow of 150 cumeecs as provided for in the Allocation Plan addresses Fish & Game’s concerns in this area.

451. There is little in the way of mitigation options when it comes to didymo. Flushing flows are a possibility but didymo has a strong resilience to high flows and it appears that large floods are the only means by which substantial removal can be expected.

452. Mr Norton offered no potential solution for mitigating the possible problems didymo could have for screening the HDI intake although he (and other ecological witnesses) suggested that if NBTC is constructed HDI water could be abstracted from the tunnel outflow before it re-enters the River, greatly reducing the amount of didymo in the HDI intake (there is unlikely to be significant growth of didymo in Lake Waitaki). However HDI representatives made it very clear to us at the hearing that there was no intention to follow this design option and they were intent on seeking consent to take water directly from the Lower Waitaki River.

453. As we note further below, we are of the view that screening of the HDI intake is necessary for sustaining Lower Waitaki River fisheries and the issue of didymo affecting the operation of a fish screen system is matter for the applicants to address through appropriate design and maintenance of the system.
Benthic Invertebrate communities

454. An assessment of the likely effects of the HDI scheme on macroinvertebrates in the Lower Waitaki River below Stonewall was provided by Dr John Stark on behalf of HDI.

455. Dr Stark noted that *Pycnocentrodes* caddisflies, elmid beetles, the mayfly *Deleatidium*, and pond snails dominate community composition of the Lower Waitaki River below Stonewall. Flow variability associated with the Waitaki Dam generation creates a 'varial' zone along the edges of the channels that is very poor habitat with very low densities and a limited variety of invertebrates. At the other extreme, the deep, swift central regions of main channels also are poor invertebrate habitats, with velocities that exceed the tolerances of most invertebrate species. Between the varial zone and the deep, swift main channel is the most productive habitat for invertebrates, where the highest densities and greatest variety of invertebrates may be found.

456. Dr Stark found invertebrate communities in backwaters and the Lower Waitaki River lagoon included many of the same taxa that live in the fast-flowing channel, however, others were found only in these still-water habitats, reflecting their inability to tolerate flowing water. Densities of all animals (except pond snails and worms) in the lagoon were low, suggesting that this slow-flowing area, with highly variable water depths, low algal and macrophyte biomass and fine sediments is a poor habitat for most taxa.

457. Dr Stark was unaware of any freshwater invertebrates of "conservation interest" in the Lower Waitaki River and tributaries.

458. Dr Stark was of the opinion that changes to mean annual low flows or median flows of the order of 7% (or less) would have no measurable effect on invertebrate communities. In dry years, he considered invertebrate communities are likely to be affected adversely, but this is a consequence mainly of climate and the additional HDI abstraction would not make an appreciable difference.

459. He noted that the worst-case HDI abstraction that complies with the Allocation Plan would draw the River down from 170.5 cumecs to the minimum flow of 150 cumecs and this would reduce the area of habitat for invertebrates in the River by 9.2%.
460. With a 150 cumecs minimum flow and considering existing takes, Dr Stark noted that HDI may reduce the mean annual low flow from 168 cumecs to 163 cumecs and this would decrease the area of habitat available for the common invertebrate taxa by between 0.6% and 1.3%.

461. Dr Stark considered these changes to be "very small" (all less than 10%) and unlikely to be measurable in terms of their impact on invertebrate communities or to have any ecological significance.

462. Dr Stark accepted that an increased risk of nuisance periphyton growths would be expected during periods of low flows, although he expected invertebrate communities to be similar in character to those that would exist at low flows under the present regime. He also considered however that the relatively short duration of these low flow events (a few weeks) would not have any noticeable adverse impact on benthic invertebrate communities, and any productive areas that had been lost temporarily by flow reduction would soon be recolonised once flows increase again.

463. Dr Stark expected the HDI abstraction to have minimal impact on the extent of the unproductive variial zone.

Conclusion

464. We agree with Dr Stark’s assessment of the effects of benthic macroinvertebrates. It is only increased periphyton growths under low conditions that we consider HDI, in association with other abstractions in summer, has the potential to influence macroinvertebrates, but at a flow of 150 cumecs we see this effect as being no more than minor given the frequency at which this might occur. Similarly, we do not consider that HDI would have much influence over the growth of didymo in the Lower Waitaki River and, of all the algae groups currently present, didymo probably has the greatest influence on macroinvertebrate communities.

Native fish

465. Dr Don Jellyman, a fisheries scientist at NIWA, presented evidence on Lower Waitaki River native fish on behalf of HDI.

466. He described how the reach from Stonewall to the sea contains the greatest diversity of native fish, with 8 species known from the main stem river and an additional 9 species in the lower/estuarine reach and lagoon. Dominant species
in the main stem are bluegill and upland bullies, common bullies, torrentfish, longfin and shortfin eels. With the exception of upland bullies, all these species are diadromous (require access to or from the sea at some stage during their life history) and their numbers fluctuate seasonally according to their recruitment seasons.

467. Smaller tributaries closer to the sea (e.g., the Waikakahi and Welcome streams) provide small channels with some overhanging riparian vegetation and dense in-stream cover provided by water plants and debris. These conditions provide good habitat for both longfin and shortfin eels, as well as common bullies.

468. A survey of wetlands associated with the Lower Waitaki River found four species of native fish. Shortfin eels were the most common species, followed by upland and common bullies, and longfin eels. No Canterbury mudfish were found, although they have been previously recorded from five sites on the north bank. Mudfish have also been found in a series of 8 small wetlands in the vicinity of the Welcome Stream, the first time this species has been recorded south of the main stem and inhabit a series of small waterways and ponds on the north bank (e.g., Whitneys Creek, Waikakahi Stream).

469. Dr Jellyman concluded that the species composition of native fish in the Lower Waitaki River is typical of braided rivers along the east coast of the South Island and, with the exception of longfin eels, native fish abundance is high for a large river.

470. Dr Jellyman noted that two species that occur in the Lower Waitaki River downstream of the HDI intake are listed on the Department of Conservation’s “threatened” species classification (longfin eel – classified as in “gradual decline”, and Canterbury mudfish – classified as “nationally endangered”).

471. Of the known locations of the mudfish, Dr Jellyman considered the Welcome Stream sites to be the only one potentially impacted by HDI in that the frequency and duration of low flows will increase. Dr Jellyman noted that the extensive macrophyte beds and lack of varial zone at these wetlands indicates that they are unlikely to be strongly influenced by main stem flows, but are maintained by springs. He was of the opinion that should the sites become dewatered for short periods, mudfish can withstand this by burrowing into the substrate where they can survive as long as they are kept moist.
472. He noted that work was being undertaken to determine the relationship between water levels in the wetlands associated with Welcome Stream and flows in the main stem Lower Waitaki River. He also recommended the fencing of these areas (especially the springhead) and an annual survey for the next 5 years to monitor the status of these 'important' habitats.

473. Dr Jellyman stated that because most native fish are dietary generalists (with their diet reflecting which benthic invertebrates are most available), in a river like the Lower Waitaki River it is probable that overall numbers of native fish are more constrained by the availability of suitable habitat than by availability of food.

474. He considered maintaining an open river mouth was essential to the well being of the many Lower Waitaki River native fish species, noting that Dr Hicks had found that an open river mouth has been maintained at flows lower than those proposed under HDI, meaning there is very low risk of mouth closure.

475. Dr Jellyman stated that a worst case scenario of very low flows and maximum HDI abstraction of 20.5 cumecs would result in small reductions in potential habitat for the six regularly encountered species (ranging from 5% reduction for longfins > 300 mm, to 18.5% for common bullies). However, such habitat reductions would be infrequent (7% of the time). Given the adaptability of native fish to varying flows, it is very unlikely that short-term habitat reductions would result in measurable impacts.

Effects of the intake on native fish

476. The HDI intake represents a potential attractive entrance to migrating native fish. While its proposed location is above the normal upstream distribution of diadromous species like common and bluegill bullies, and torrentfish, other upstream species of concern are juvenile eels of longfins in particular. For downstream moving species, there will be occasional juvenile lampreys, and koaro, but according to Dr Jellyman the main species of concern are migratory eels, especially longfins.

477. In recognition that the HDI proposal could entrain migrating native fish as well as juvenile salmonids, Dr Jellyman described how a fish screen is proposed at the intake with a bypass to return diverted fish back to the River. As also stated by Mr Graynoth, a fisheries scientist with NIWA he noted that details of the screen design have not yet been finalised, but would need to be to the satisfaction of the Regional Council.
478. He described some possible alternatives to fine mesh screens should didymo prove problematic in their maintenance and operation.

479. He noted how a recent review of fish screening requirements indicated that screen apertures of 3 mm would prevent most juvenile eels (and other native species except fry of upland bullies) from entering the HDI pumping station. From here, they would be diverted back to the river via a bypass.

Habitat of Trout and Salmon

480. Mr Eric Graynoth, referred to above gave evidence on the effects of the HDI scheme on salmonids in the Lower Waitaki River (especially below Stonewall). In addition to the effects of flow, he assessed the effects of intake construction works, an intake screen and fish passes on ecological values near the proposed intake.

481. He noted that the Lower Waitaki River salmon fishery is of national importance.

482. Mr Graynoth was of the opinion that a principle concern associated with flow reductions was that they decrease the amount of fish and invertebrate habitat in small side channels and may increase habitat in main channels (as dealt with above by Mr Jowett).

483. He noted the Lower Waitaki River supports a nationally significant recreational fishery for salmon and trout, citing statistics of 34,500 angler visits in 1994/95 and 26,600 in 2001/02, annual salmon catches from 1980 to 1986 ranged from 1,700 to 19,700 with an average of 8,600 fish. However, the number of salmon returning to the Lower Waitaki and other Canterbury rivers had declined substantially since 1997, although the runs in 2007 were possibly the highest for 5 years, citing figures of 2,000 to 3,000 fish being present.

484. Brown trout make up a substantial part of the catch and rainbow trout support a highly valued fishery in the Kurow area. Trout caught by anglers usually range from about 30 to 50 cm in length, although fish up to 70 cm and 4 kg in weight are occasionally taken. The average length and weight remained virtually unchanged from 1957 to the mid 1980s. The numbers of adult trout in the River could range from 9,000 to over 20,000 fish.
485. Mr Graynoth noted in his evidence that the effects of current irrigation schemes on the trout and salmon stocks of the Lower Waitaki River have not been studied.

Salmon

486. Mr Graynoth was of the view that the HDI scheme was likely to have little, if any, adverse impacts on salmon fry and juveniles in most years. Minimum flows would rarely drop to 150 cumec for extended periods of time according to the evidence of Mr Jowett and this should maintain salmon habitat close to current levels. Flows will always exceed that required for the upstream passage of salmon and trout.

487. Occasions when the HDI scheme might limit fry production and the numbers of returning adult salmon were considered by Mr Graynoth to be restricted to only a few, relatively rare, circumstances associated with drought conditions in October and November coinciding with high densities of fry in the River. Under such circumstances, the increased variability in flow and short term reduction in habitat, especially in small side braids, is likely to reduce fry survival rates in these extremely dry years. However, he concluded that a minor reduction in survival rates in drought years in the Lower Waitaki River is likely to have little or no measurable effect on the numbers of adult salmon returning due to other sources of mortality later in the salmon's life cycle (e.g., floods in late summer and autumn, variations in marine survival rates).

488. Mr Graynoth also noted that most salmon spawn, and probably rear, in the middle and upper reaches of the Lower Waitaki River, and these stocks would be protected and maintained irrespective of whether or not HDI proceeds. Consequently the HDI scheme would be unlikely to have any major impacts on the salmon runs of the Lower Waitaki River, even when combined with a total abstraction of 90 cumecs.

489. Spawning surveys reported by Mr Mark Webb, Central South Island Fish & Game, showed that the reach of river affected by the HDI sustains on average 25% of all salmon spawning in the Lower Waitaki River.

Trout

490. As for salmon, Mr Graynoth concluded that the HDI scheme would have little, if any, adverse impacts on juvenile and adult trout in most years, even when
combined with total abstractions of up to 90 cumecs. He noted that the minimum flow would 'rarely' drop to 150 cumecs or below, and so trout habitat should be maintained at similar levels to that found at present. Juvenile trout would likely respond in a similar way to juvenile salmon to reductions in flow and are most likely to be adversely affected during extreme dry years. He considered that adult trout will probably sense flow reductions and move to larger channels.

**Screening of the intake for salmonids**

491. Fish will be attracted to the HDI intake from the Lower Waitaki River. Mr Graynoth considered that fish screens are essential as a large percentage of the river flow could be abstracted by the HDI and other irrigation schemes during dry periods.

492. While fish screening was considered by all fisheries experts to be necessary, no detailed design was provided at the hearing as none had yet been undertaken.

493. Mr Graynoth discussed current best practice for fish screen design in Canterbury which provided guidance on the key design features necessary for fish screens. However he also noted that it would be difficult to maintain totally effective fish screens given the silt, algae (including didymo) and debris load of the present Lower Waitaki River. He recommended that the design be thoroughly field tested, perhaps in a smaller irrigation scheme, prior to final approval of the fish screen by the Regional Council and construction of the HDI scheme.

**Conclusion on fish**

494. We are satisfied that HDI in combination with a 150 cumecs minimum flow will have no more than minor effects on the fisheries of the Lower Waitaki River. Significant instream habitat for all fish species, and fish food (macroinvertebrates) remains at 150 cumecs, and the risk of an increase in nuisance algal growths affecting macroinvertebrate community structure is minimised.

495. A physical screen at the intake with a mesh or bar spacing of 3mm appears to be necessary to meet stringent fish screen guidelines promoted by the Regional Council and, provided other important aspects of the fish barrier are provided for (e.g., a flow system at the screen to return fish back to the river), this would be sufficient to keep out juvenile eels and trout and
provide a safe route back to the river. Mr Graynoth suggested that if fish screening proved too difficult or expensive to construct, alternatives could be found in the form of a less efficient screen, and rock groynes, or louvers and other behavioural barriers at unscreened irrigation intakes elsewhere in the Lower Waitaki River. Fish diverted back into the Lower Waitaki River at these locations could compensate for minor losses into the HDI scheme.

496. We do not consider these latter mitigation options to be practical given we have to assess the effects of the HDI intake and not the effects of other, consented, irrigation intakes. We also heard no evidence from any expert as to the effectiveness of these possible alternative fish barriers. Indeed, Mr Webb pointed out to us that the efficiency of existing fish barriers on the Lower Waitaki River intakes (e.g., the Downlands Irrigation Scheme rock bund) had not been assessed.

Birds

497. The Lower Waitaki River, including the reach from Stonewall to the sea, is ecologically significant for its range of braided river bird species, including threatened species, and their habitats. Threatened braided river bird species below Stonewall included black-fronted tern, black-billed gull, white-fronted tern, wrybill and black stilt.

498. Of the key threats to braided river birds, those that relate to flow regimes are predators, vegetation encroachment, feeding habitat and floods during the breeding season.

499. Ms Robertson concluded that HDI with a minimum flow of 100 cusecs is not expected to change the braided river bird habitat with regard to feeding habitat and flooding of breeding birds. There is likely to be a marginal increase in vegetation encroachment and she supported Dr Hicks’ recommendation for additional works to control the additional vegetation in the fairway. HDI may increase the risk of predation of breeding birds on islands particularly in dry years and Ms Robertson recommended enhancement of 2 or 3 islands that are used by white-fronted tern, black-billed gull and black-fronted tern as mitigation for this potential effect.

500. Dr Bartlett (on behalf of Te Runanga o Ngai Tahu) was concerned that the above mitigation outlined by Ms Robertson did not quantify the area of vegetation to be cleared or whether monitoring was proposed to determine if this vegetation
clearance enhances breeding success. She noted that no recommendations had been made for predator control and in her opinion this should be included.

501. Similar concerns were expressed by Ms Marion Yoder on behalf of the Royal Forest and Bird Protection Society of New Zealand Inc.

Conclusion

502. We are satisfied that a minimum flow of 150 cumecs will result in no more than minor effects on birds and for much the same reasons as those given earlier concerning hydrological effects we consider this conclusion is valid without the need for mitigation by the consent holders.

Lower Waitaki River Commercial and Recreation Uses

Commercial eelers/Customary eelers

503. Dr Jellyman noted a concern of eel fishers (commercial, but relevant to customary use also) was that flows greater than 150 cumecs would be required to give sufficient depth for them to get jet boat access to some of the productive habitats they currently fish. However, maps of the predicted passage depths at flows of 100 and 140 cumecs at Ferry Road showed that minimum navigable depth for jet boat passage of 0.2 m (Mosley 1983) was maintained virtually throughout the modelled reach, while the preferred depth of 0.6 m is available over extended areas.

Jet boating

504. Mr Jeffrey Wilson, a committee member of the Waitaki Branch of Jet Boating New Zealand Inc., made a submission on behalf of Jet Boating New Zealand (JBNZ). He noted that the local Waitaki branch of LBNZ had 120 members and estimated there would be nearly 360 jet boaters in the local branch area.

505. JBNZ considers the Lower Waitaki River to be one of the most significant rivers available for jet boating in New Zealand, as it offers the "ultimate big braided river jet boating experience by providing opportunities to boat both big and fast flowing channels or shallow braids all in the same reach of the river".

506. He stated that a survey of members has indicated that about 65% of them use the section of the river below Stonewall, with many of them using it for salmon fishing.
507. He also stated that JBNZ supports the retention of the Allocation Plan's minimum flow regime of 150 cumeecs between the Waitaki Dam and the sea. JBNZ's did not object to HDI's proposal to take 20.5 cumeecs from the River because this would have little effect on the current mean flow of 380 cumeecs. The Group's main concern was related to abstractions allowing the River to drop below 150 cumeecs. Mr Wilson also expressed some concern over the effect of didymo on jet boating at lower river flows.

Game bird hunting

508. Ms Robertson concluded that game bird hunting is unlikely to be affected by the proposed HDI flow regime with game bird hunting occurring in winter, when there will be no changes in the flow regime. The proposed irrigation takes and minimum flow are not expected to affect game bird populations.

509. Mr Webb described how Central South Island Fish & Game issues about 2,000 game bird hunting licences and that the Lower Waitaki River and its associated wetlands sustain approximately one-third of all bird hunting activity in the region. The Stonewall to river mouth section of the Lower Waitaki River sustains about double the activity of the Waitaki Dam to Stonewall reach.

Salmon angling

510. The Lower Waitaki River is the largest of the Canterbury salmon rivers in terms of flow. Salmon anglers who fish the River are used to fishing high and variable flows. High flows and vegetation encroachment make access to fishing lies difficult for the foot angler and so salmon angling by jet boat, or by drifting dinghy, is popular on the River.

511. The current flow regime provides monthly median flows during the salmon angling season (January to April) from 322 to 369 cumeecs, and average daily fluctuations in the order of 80 cumeecs and average 30 day fluctuations of 300 cumeecs.

512. Dr John Hayes gave evidence on behalf of HDI on salmon angling flow requirements in the Lower Waitaki River and an evaluation of effects of HDI. He noted that the extent and proportion of salmon angling habitat reduced sharply below about 100 cumeecs.

513. He noted that salmon anglers fish the River whenever the water is clear enough for fishing, which he described as when the river bed can be seen
through about 0.4 m depth or more. He described the difficult access for salmon anglers of the Lower Waitaki River due to its high flows and vegetation encroachment. Access to fishing lies are difficult for the foot angler, and jet boat or drifting dinghy, are therefore popular. Anglers are used to this high flow character and, as we heard from other witnesses, many prefer it that way. A recent recreational survey reported most salmon anglers preferred 300-350 cumecs of flow, but that high flow limited salmon fishing more often than low flow.

514. Dr Hayes described how expert anglers assessed the area of salmon angling lies at flows of 90, 119, 152, and 350 cumecs. The survey found the quantity and quality of salmon angling lies declined steeply below 152 cumecs, but the precise point at which this occurs is uncertain given the few flows studied. The quality of angling lies declined most steeply below 119 cumecs.

515. Dr Hayes concluded that the best flows for salmon angling habitat in the study reach are in the range 130 – 200 cumecs, with the best single flow about 150 cumecs. He said this flow is also consistent with the optimum flow indicated from the expert angler assessment of the quantity and quality of fishing lies. The greatest number, area, and quality of salmon angling lies occurred at 152 cumecs, although he did concede it could be as high as 250 cumecs taking into account the imprecision in the estimates with only 3 – 4 flows surveyed.

516. In terms of comparing the various low flow regimes for the Lower Waitaki River, Dr Hayes stated that with a 150 cumecs minimum, the flow would be at 150 cumecs at some time during 79% of peak salmon seasons.

517. Dr Hayes appeared somewhat equivocal when he stated that salmon anglers will experience similar angling habitat conditions most of the time under the HDI flow regime as they have under the Status Quo regime. He then went on to say that flows greater than 150 cumecs are arguably higher than are necessary for good salmon angling habitat, but nevertheless have sustained the 'nationally important' lower Waitaki River salmon fishery in the past and, overall, anglers appear 'happy' with them.

518. If NBTC was constructed and operating, Dr Hayes considered that the combined irrigation take of 90 cumecs below Stonewall and a minimum flow of 100 cumecs will add to the effects of that scheme on the 'big river' salmon angling experience. We therefore presume that a 150 cumecs minimum flow will lessen this effect. Dr Hayes stated NBTC will reduce, but not eliminate, the big
river salmon angling experience upstream of Stonewall which supports about 36% of salmon angling effort. While the flow regime downstream of Stonewall to the river mouth, where most (64%) fishing effort occurs, would be similar to that occurring in the past, additional irrigation allowed under the Allocation Plan will reduce the big river fishing experience in this part of the river too, albeit mainly in dry years.

519. Slightly discoloured water provides ideal water clarity for salmon angling. We heard that on unregulated rivers, such as the Rakaia and Rangitata, these conditions occur during flood recessions, with conditions being ideal over a period of a few days to a week before the river clears too much. In the Lower Waitaki River, the influence of flood events in the headwaters on flow and water clarity is buffered, and delayed by the storage reservoirs such that water clarity is uncoupled to a large degree from the storm events in the headwaters, where most of the flow originates.

520. Dr Hayes found that in the Lower Waitaki River, at flows greater than 450 cusecs, water clarity declines downstream from Kurow, probably due to mobilisation of fine sediment from the river bed. Conversely at such flows, the river gets clearer closer towards the Waitaki Dam, which makes salmon harder to catch upstream. This is one of the reasons why angling is more popular in the lower reaches of the River. He speculated that higher flows associated with the existing flow regime may compensate, to some degree, for the normal shyness of salmon in clear water that occurs further upstream, but he was unsure of the exact relationship and the combined influence of flow, clarity and water temperature.

521. Dr Hayes noted that if consent is granted for NBTC (which it since has been), the cumulative effects of this scheme and the combined irrigation takes downstream of Stonewall on salmon angling will be significant in the absence of mitigation.

522. Because NBTC diverts a peak flow of 260 cusecs through a 34 km tunnel between Waitaki Dam and Stonewall, with flow in the diversion reach being reduced to 125 – 150 cusecs over the salmon angling season, there will be an increase in water clarity at Stonewall by as much as 1.4 m, or 32%, when the water is clear (> 3m) at Waitaki Dam, unless mitigation is provided in the form of flow variability or injection of fine sediment. With NBTC in place, significant fine sediment re-suspension will begin at the cutfall rather than below Waitaki Dam as
currently occurs.

523. The effect of the 90 cumecs combined irrigation take on water clarity below Stonewall (0.4m or 9% reduction in clarity) will add to this NBTC effect resulting in a cumulative increase in water clarity at the river mouth of 1.8 m, or 41%.

524. Dr Hayes noted how MEL has proposed to mitigate the effect of the NBTC Scheme on water clarity by providing a variable flow regime which will be determined by adaptive management over at least two years monitoring flow and water clarity. We now know that consents granted for NBTC require a minimum of 7 flushing flows during the salmon angling season. The current variable flow regime will be retained below Stonewall under the NBTC, so both flow and water clarity will still be variable in most years favouring salmon angling at those times, although downstream clarity will be greater.

Conclusion

525. Dr Hayes concluded that with the proposed HDI flow regime as sought by the applicant, effects will be noticeable by salmon anglers during dry years. The cumulative effects of NBTC and full irrigation uptake downstream of Black Point will be significant in the absence of mitigation.

526. The Central South Island Fish & Game Council, through Mr Webb, considered the Lower Waitaki River to be the only river that offers the “big river” experience.

527. We consider that the 150 cumecs minimum flow below Stonewall will protect the interests of recreational users and we have already concluded that fish and fish food habitat will be protected, notwithstanding the potential long-term effects of didymo on the river ecosystem and recreational use. Mr Jeremy Walton, a salmon angling and jet boating enthusiast with considerable experience of these activities in the Lower Waitaki River, made a submission in opposition to HDI and gave evidence at the hearing. We noted him when he said, “In my opinion the Waitaki Water Allocation Board got the formula nearly right for the Waitaki River between Black Point and the sea. Of great importance the Board set a realistic allocation limit of 90 cumecs for all abstractions. It also set a minimum flow of 150 cumecs. If these parameters are upheld, the river will virtually look after itself. The one thing that is lacking is provision for regular flood flows which are now more important given the recent advent
of didymo."

528. We largely agree with Mr Walton's conclusion, but note that if NBTC proceeds, regular flushing flows will be required to be released from Waitaki Dam and these will continue on past Black Point. However, we also note that floods of the magnitude that appear necessary to remove significant amounts of didymo are unable to be manufactured on a regular basis by the operators of the Waitaki Hydro Scheme and are probably of a scale that occur on average once every second year. While such flow events might provide some respite from didymo, the effects may be short lived given its prolific growth rate in the River. Unfortunately for one and all, there is little that can be done about that at this point in time, and this is the reality of the existing environment.

529. We note that Mr Walton's concerns largely reflected those of Jet Boating New Zealand (through Mr Jeffrey Wilson). JBNZ recommended that we grant HDI consent with a condition that the absolute minimum flow of 150 cumecs be maintained in the river. As recorded earlier in this decision we propose to do that.

Out of Stream Users of the Lower Waitaki River

530. In this section of this decision we deal with the evidence of a number of witnesses who were called in full or partial opposition to HDI because of the anticipated adverse effects that it may have on their existing and future activities.

531. In the main, but not wholly so, this evidence came from existing irrigators who were concerned about the HDI proposals for flow sharing in a low flow situation The existing consent holders considered they should have priority in low flow situations and should not have to rank equally with HDI or any other new consent holders. They did however support the 100 cumecs cut-off but of course we have now ruled that out anyway, as we have noted earlier in this decision when dealing with reliability of supply these consent holders are already "banded" in various ways and in this decision we are unable to alter this in any way. Hence we have decided in the same section of this decision to adopt a ramping down for HDI that will retain the priority of these existing consent holders. That being the case there is no longer any need for us to consider their evidence further in this section of this decision and we can come directly to the evidence of other out of stream users who claim to be affected.
532. Mr Ernest McKenzie is the chairman of Irrigation North Otago Ltd (INO). Mr McKenzie is a chartered accountant in Oamaru specialising in accounting services for the rural sector.

533. Mr McKenzie told us that when investigations were undertaken in the North Otago Downlands' area with regard to irrigation there were two main groups formed to promote schemes. One was NOIC and the other was North Otago Gravity Irrigation Scheme, otherwise known as Gravity. Each group had a different philosophy. NOIC was looking at a pipe system under pressure, whereas Gravity, as its name implies, was looking at a scheme that did not require pumping. In the original Gravity Scheme it was proposed to take water from the Lower Waitaki River above Kurow through a canal and then into a pipe network all under gravity.

534. Both groups became entrenched in their views, hence a community group was formed to try to rationalise the schemes and get the whole community working together. This group was called Irrigation North Otago, or INO. It was agreed that NOIC would continue its investigations and develop Stage 1 of its scheme, while further studies were carried out over the whole of the command area, by which we understood Mr McKenzie to mean the North Otago Downlands. He went on to say that it was further agreed that Gravity would continue also with its investigations and lodge a resource consent application to take 25 cumecs at Kurow to irrigate 50,000 hectares. This application was subsequently lodged and was among the applications that were later called in by the Minister for the Environment.

535. In the meantime, Downlands (or NOIC) obtained resource consent to take eight cumecs at Black Point for irrigation of 20,000 hectares. Stage 1 of NOIC is now complete. A smaller scheme has also been built in the Horse Gully area and the Lower Waitaki Irrigation Company has expanded its operation to enable irrigation of the land facing onto the Waitaki Plains.

536. Nonetheless, INO considers there remains an area of up to 20,000 hectares to be irrigated in the future and for which no water is currently allocated and which has been excluded from the applicants' calculations.

537. INO employed OPUS to re-visit its application that it had previously lodged and it was agreed the application would be revised to reflect developments that have been completed since it was originally lodged. The application would be
revised to consider a take only and reduce the quantity from 25 cumecs to 10 cumecs.

538. After the Allocation Plan information was released by the Regional Council which showed the true status of allocation downstream of the Waitaki Dam, it became apparent that there is insufficient volumetric allowance to accommodate the INO option as envisaged.

539. Mr McKenzie went on to say that INO may be criticised for not having aggressively pursued its application but in its defence he said that INO considers that the intent of the Allocation Plan was to provide sufficient allocation to meet the needs of future identified users. He said funding was also a major consideration. Funding could be affected if Stage 2 of NOIC takes place.

540. On the matter of funding Mr McKenzie went on to say that INO has obtained $50,000 from the Waitaki District Council to re-commence work on satisfying requests for further information from both the Canterbury and Otago Regional Councils to enable its present application which is on hold to proceed further. The application is now one, as he has said before, to take water from Black Point.

541. However INO is in difficulties because, although it can show demand to support the application, it cannot detail what its scheme will be until it knows whether NOIC’s Stage 2 has been finalised. When that is known it will then be able to provide details of areas still to be irrigated, less the NOIC areas, to make up the 20,000 hectares, which will include 4,905 hectares for future growth and infill.

542. Having regard to the foregoing Mr McKenzie went on to say that based on Mr Pott’s data (this would not be the same as Environment Canterbury’s) necessarily, INO would require nine cumecs and 120 million cubic metres per annum. Again, based on Mr Pott’s data, 14.4 cumecs is available from the 90 cumecs allocated under the Plan and currently, including HDI, some 72.1 million cubic metres per annum is available from the 1100 million cubic metres allocated in terms of the Plan. This clearly is insufficient to meet the future needs of INO. He also disagreed with Mr Potts who had said that he thought it was unlikely that INO would be commenced before 2015 and possibly 2025. Mr McKenzie said it is likely INO would be developed in a shorter timeframe.
543. Mr McKenzie then addressed the question as to what remedy he sought in the context of the HDI decision to ensure there would be enough water for INO. He pointed out that part of the HDI scheme command area is north of the Pareora River and this is in the Timaru District, which he said is well outside the purview of the Allocation Plan, which talks about effects in the Waitaki District and the Waimate District, even though parts of those districts are themselves outside of the Waitaki Catchment. The area involved north of the Pareora River, according to Mr McKenzie, is 3,379 hectares and this accounts for some 20 million cubic metres of water per annum but note that would only bring him up to 92 million cubic metres and he said they need 120 million cubic metres.

544. Mr McKenzie went on to say that the HDI lapse period of 10 years is too long so that period should be reduced and this might clarify sooner how much water will be available for other schemes.

545. Mr Souness is a farmer in South Otago and has been for the last 14 years. In 2001, he bought his present property in the North Otago Downlands area. It is a dry land farm. Along with two neighbouring farmers, he applied for and was granted a water permit to take water from the Lower Waitaki River, which allows them all to irrigate their respective properties at 0.4 litres per hectare with coverage of 25 millimetres per hectare per week.

546. In 2003, along with several other farmers he helped to form the North Otago Sustainable Irrigation Research Group to investigate irrigation and his farm became the monitor farm. Aqualinc, from Lincoln University, has done the monitoring. As a result of this monitoring it was found that the water holding capacity of his land is in fact 35 millimetres. This evidence we think was designed to inform us and possibly persuade us that HDI at 0.53 litres a hectare is excessive because he can do it with 0.4 litres a hectare. However as stated in an earlier section of this decision we have accepted Mr Pott’s evidence on this matter.

547. Dr Helen Brookes works for Waitaki First Incorporated who had given evidence at the NBTC hearing as well. She told us that she is retired and lives with her husband on a small farm in the Lower Waitaki Valley within two kilometres of the Lower Waitaki River. Dr Brookes told us that she was concerned in this case about the application of Policy 14 to do with the reasonably foreseeable in-catchment needs and the needs of existing consent holders, and also about Policy 11 to do with cultural values.
548. She noted that in formulating the Allocation Plan the Water Allocation Board had excluded the Timaru District from the term "local area" for the purposes of allocating water to activities and she referred to Annex 1, page 25, which contains the reasons for the Board’s decisions. It was her view that the HDI consent should be limited in its command area to the Waimate District.

549. Dr Brookes also talked about what would happen if NBTC did proceed or did not proceed but either way there would be impacts on other users from HDI. She talked about the reliability of groundwater consents being put at risk but we are not clear that she meant as a result of HDI, which removes some 20.5 cumecs of water from the River.

550. She went on to say there are information gaps in the HDI case. Not enough is said about the cumulative effects, particularly if NBTC proceeds. She said that HDI’s answer, or MEL’s answer, for HDI, that below Black Point, the river flow is at status quo if NBTC proceeds, does not satisfy her because, for example it is possible that the tunnel outfall flows could affect the river braiding pattern and also there is an issue about flow variability between the dam and Black Point. We note here that we have already dealt with this issue in our decision on the NBTC.

551. Dr Brookes then referred to the HDI proposal as “a water grab”. She said this was the case because consent was being sought for 35 years with a 10 year lapse period and there was no real evidence about whether or not the water would be taken up. She asserted that the need to meet other applications, and INO was referred to, needs to be considered by us. HDI is seeking to lock up the water.

552. Mr Gary Mulvena was a submitter in opposition. Mr Mulvena told us that he is not against the HDI itself but he is opposed to reducing the minimum flow in the Lower Waitaki River from 150 to 100 and he was implacably opposed to that. The rest of Mr Mulvena’s evidence consisted of rambling expressions of concern about other rivers under threat, about processes like hearings “out of town” and about some kind of a conspiracy, as he saw it, with the fact that the Holcim application for a cement factory out of Oamaru was being dealt with at the same time. He also used some quite flamboyant language such as, for example, saying that recreational users are being “terrorised”.

553. Much of his evidence seemed to be directed towards the NBTC case which, of course, we had already ruled earlier he was not entitled to address because
he was not a submitter on that application. He concluded by saying, "Don't be surprised, if you approve the applications (a reference also to NBTC) that the sh—hits the fan". He said the only fair decision is to leave what little water is left in the Lower Waitaki River alone, especially the minimum flow.

554. Mr Bill Penno is the chair of the Lower Waitaki River Management Society. This Society also gave evidence at the NBTC hearing. He told us that the society supports the Allocation Plan and sees it as a kind of "current legal contract" agreed to by the community concerning the allocation of water from the Lower Waitaki River. He said that the Society is committed to "advocating against abstractions over those currently permitted under the allocation plan". We understood him to be saying, although it is not clear from his statement that the Society is opposed to the granting of consent for non-complying activities because otherwise the two above quoted statements are inconsistent since the Allocation Plan does provide for additional new abstractions. All was made clear, however, when he later said, "Therefore, the society has resolved to oppose any application that is non-complying in respect of the allocation plan".

555. Mr Penno then handed over the presentation of the Society's case to another witness who had also given evidence at the NBTC hearing, Mr Dugal McTavish, who continued with the presentation. Mr McTavish told us that the Society is concerned about the vulnerability of the River and the proposal to reduce the minimum flow below 150 cumecs. The Society is also concerned about the precedent effect of granting consents for non-complying activities and was critical of the HDI application and its heavy reliance on flow data from past records as a basis for determining the future reliability of the flow and he said he thought this was highly misleading.

556. Mr McTavish went on to say that if MEL will not put water down the River to remove the risk of a supply shortfall for irrigation at low flow times then demand side adjustments should be made. These could include:

A. Utilising off-farm (above ground or aquifer), or on-farm storage.

B. Reducing the extent of the command area to irrigate, for example, the Waihao Downs only.

C. Increase the proportion of crops to pasture under irrigation.

D. Improving irrigation efficiency by canal lining or piping.
E. Reduce the peak unit irrigation supply rate by accepting a lower reliability.

F. Maintaining same scheme but accepting a degree of unreliability.

557. He made the point that HDI is non-complying because it is lowering the River minimum flow from the Allocation Plan. This represents a cross transfer to the environment and therefore the public. Part of the precedent effect lies in the fact that if HDI is allowed to operate at a lower flow than 100 cumeecs, others will be entitled to do the same.

On 2 March 2010, as we have recorded earlier in this decision, we resumed the hearing of this application to deal specifically with the matters raised by the evidence of the witnesses just referred to- see our Minute to Parties of 11 December 2009 Appendix 4.

558. On the matter of whether the Timaru District component of the HDI command area should be included in the Scheme we heard additional submissions and evidence from the applicants and also from two submitters in support. Irrigation North Otago (INO) was served with the Minute to Parties and also with the notice of the resumed hearing but following a request from us to ascertain whether it wished to be heard further on this matter we were advised by Regional Council staff that it did not wish to be heard.

559. We will not lengthen this decision any further by going into the additional submissions and evidence in any detail. Ms Appleyard the applicants’ counsel and Ms Dawson the applicants’ planner both made the point that on a proper analysis of Policies 11 and 12 in the Allocation Plan there is no preference shown for the out of catchment part of the Waitaki District over the Timaru District component of the HDI command area. Put another way neither Policy precludes consideration of the Timaru District where there may be competing proposals in say the Waitaki District.

560. Mr Potts to whom we have referred earlier in this decision on the need for water and water allocation also gave evidence for the applicants. He did an analysis based on Mr McKenzie’s evidence and in particular his Table 1. He concluded that a reasonable requirement for INO would be a rate of take of 7.5 cumeecs and an annual volume of 71.5 million cubic metres. In terms of Rule 2 Table 3 of the Allocation Plan the rate of take comes within the 90 cumeecs allocation limit even if the Timaru District component is included in the HDI command area. In terms of Rule 6 Table 5 there is a shortfall of approximately 4
million cubic metres per annum if the Timaru District component is included. Mr Potts considered that it is very likely that efficiency gains over time, particularly in the larger existing irrigation schemes, will result in decreases in the existing water allocations that will be greater than 4 million cubic metres per annum. He instanced a recent example concerning the Morvem Glenavy Ikawai Scheme where an additional area of some 4,500 hectares will be able to be irrigated in terms of that scheme within its existing water allocation because some farms have converted from border dyke to spray irrigation.

561. Ms Jane Annear the Mayor of Timaru gave evidence on behalf of that submitter and Ms Wendy Smith the CEO of the Aoraki Development Trust gave evidence of behalf of that submitter.

562. Ms Annear reiterated the point made by Mr Potts and a number of other farming witnesses at the substantive hearing that the only current and viable proposal for irrigation in the Timaru District component of the HDI command area is the HDI scheme to take water from the Lower Waitaki River. We have referred to this evidence in detail earlier in this decision.

563. Ms Smith gave evidence about the success of the Opuha Dam scheme, particularly in economic terms, and again this was a reiteration of evidence we had received at the substantive hearing which is also recorded earlier in this decision.

564. On the matter of the lapsing of the consent (if granted) we had further evidence from Mr Brian Ellwood a Water Infrastructure Project Manager with MEL who gave evidence about a possible time line for the HDI project and addressed a revised set of conditions for this consent that in respect of this matter is based on the Environment Court’s interim decision in the NBTC case. He told us that following a review of the development programme a 10 year lapsing period was the minimum that should be allowed for. This would provide for 2 years to complete the engineering study for the layout of the Scheme; 2 years to prepare lodge and have heard the applications for consent required for the second consenting stage; 1 year for any appeals and associated hearings to achieve final decisions; 2 years for detailed design and selection of a constructor and 3 years for construction and commissioning. The construction will be largely an earth works project and will be weather dependent.
However, the latest set of conditions proferred by the applicants at the resumed hearing in March, now provides for the lapsing period of 10 years to be conditional on progress being made within 5 years with regard to the pre-commissioning conditions of the consent and complete applications for the primary consents of the second stage being lodged. Alternatively if they have been refused and all appeal rights have been exhausted within the 5 year period the lapsing condition is automatically extinguished. Consequently substantial progress towards implementation will have to be made in the first 5 years and the applicants will not simply be able to sit on this consent for the next 10 years.

On the matter of alternative sources of water for the Timaru District component of the HDI command area Mr Elwood also reminded us that in evidence at the substantive hearing another other witnesses for the applicants Mr Andrew Robertson MEL’s Director of Strategy told us that Lake Tekapo water could not be accessed as an alternative source while MEL held resource consents for the Waitaki Power Scheme. Indeed on re-reading Mr Robertson’s evidence it is clear that part of MEL’s motivation for being involved in the HDI Scheme is to be able to resist further attempts to access Lake Tekapo water in 2025 when the Waitaki Power Scheme consents expire.

Conclusion

We have carefully considered all the evidence on the topic of the inclusion or exclusion of the Timaru District component in the HDI command area and we have concluded that it should remain part of that Scheme.

We think Policies 11 and 12 in the Allocation Plan are capable of the interpretation given to them by Ms Appleyard and Ms Dawson at the least to the extent that an out of catchment allocation of Lower Waitaki River water in the Timaru District is not precluded even if there are out of catchment proposals for the use of Lower Waitaki River water in the Waitaki District or the Waimate District for that matter. We think in such circumstances judgments need to be made in the context of both local and national effects and included in that process will be a number of factors such as the need for water in the Waitaki catchment itself which has a priority in terms of Policy 14 in the Plan; the water available for allocation at the time in terms of the Plan; and the out of catchment needs of the potentially competing areas.
569. In this case too however, we are conscious of the fact that the Allocation Board expressly declined to make an allocation for the Timaru District – see paragraph 200 of its reasons for decision Annex 1 to the Plan. The reason for this appears to be that it concluded on the evidence then available to it that the Timaru District (and we think on the basis of the evidence we have heard it was probably that part of that District in the HDI command area because evidence about the HDI proposal was before the Board) had some access to alternative water sources.

570. On the basis of the evidence we have received in these proceedings we accept that there are no viable alternative water sources for this already water short area at the present time. It is clear to us that the only realistic alternative could be Lake Tekapo and at best this might become available in 2025 but clearly not if MEL has its way.

571. We have just referred to the Timaru District component of the HDI command area as “water short” and the evidence we have heard has certainly established that. The evidence also establishes that substantially, in catchment needs for irrigation water are being met. In the INO area there is still uncertainty over the final extent of that scheme if and when it is progressed, but on the basis of Mr Potts’ evidence there is almost enough water available in terms of the Plan to service now, both that scheme as it was outlined to us by Mr Mckenzie and the whole of the HID scheme. That situation could well improve as ongoing improvements are made in the efficiency of existing irrigation schemes- a matter that is expressly provided for in the policies of the Allocation Plan.

572. It is for these reasons that we have concluded that the HDI scheme should include the Timaru District component.

573. On the matter of the lapsing period we are now satisfied that the new condition referred to above will ensure the applicants either use this consent (if granted) in a reasonable time or they will lose it.

574. Finally, we think Mr Mulvena’s principal concern and that of the Lower Waitaki River Management Society are both met by reason of the fact that if we grant this consent the Allocation Plan’s environmental flow regime for the Lower Waitaki River will be maintained.
Landscape, Spiritual and Maori Values

575. Allan Rackham is a Landscape Architect whose qualifications and experience are well known to us. He gave evidence in support of the NBTC proposal and we accept him as an expert in this area.

576. In this case he gave evidence first about the Waitaki Valley and the Lower Waitaki River, that is the area and river below the Waitaki Dam, and later he also gave some evidence about landscape values in the HDI command area. Turning first to the Waitaki Valley and the River he said that view points of the river and points of easy access to it, such as SH1 Bridge, Stonewall and Borton’s intake are infrequent but are valued by people.

577. The lower valley east of Stonewall is a broad open fan where the two main roads, SH82 and SH83 are generally aligned well away from the river.

578. The Lower Waitaki Valley contains many special qualities and valued landscape features. They include sites of special importance to Tangata whenua some of which are not only recognised as important cultural sites but also have high aesthetic legibility and natural scenic values.

579. The landscape generally is characterised as an efficient, productive, well ordered agricultural landscape with a pleasant rural atmosphere.

580. At Stonewall amenity values are associated with its proximity to the River. Views become possible through to the River at this point and it is used as a river access point by boaters and anglers.

581. In spite of the special features and qualities earlier referred to Mr Rackham said that the Lower Waitaki Valley has not been identified as an outstanding natural landscape in any previous landscape assessment. It is not so classified in the Canterbury Regional Landscape Study or the Waitaki Landscape Study.

582. In the opinion of this witness the Lower Waitaki Valley landscape is principally a farming environment, which while attractive and containing a number of interesting and valued sites, is not sufficiently special to be considered an outstanding landscape under section 6(b) of the RMA. The landscape downstream of Stonewall and Black Point is the least impressive of the whole of the valley landscape.
583. We pause to comment here that this is a view that was also expressed by Mr Rackham in his evidence before us in the NBTC case, and in the end as we recorded in our decision on that case, we accepted his opinion with regard to section 6(b) of the RMA. We do so again here.

584. Turning to the Lower Waitaki River itself the witness said that it is the largest of the braided rivers in Canterbury. The lower reaches below the Waitaki Dam have been substantially affected by upstream hydro electric development which has significantly modified the natural flow regime. The River has gradually adjusted to these controlled flows and to changes in river management. The upstream dams moderate flows and flows fluctuate on a daily and weekly basis according to power demand.

585. Recent work by the National Institute of Water and Atmosphere (NIWA) indicates that the Lower Waitaki River is on a long term path to fewer braids. In many places the river banks are substantially modified by fairway management and stopbank/groyne construction. The major built structures include the Waitaki Dam, the transmission lines crossing near Borton’s Pond and the intake structures associated with the Lower Waitaki Irrigation Scheme.

586. On the matter of the values of the Lower Waitaki River Mr Rackham pointed out that it has not been considered outstanding in previous landscape assessments but it has many important values including natural science, highly valued fisheries, a site for rare riverbed bird species and the river braids are described in the present inventory of the Geological Society of New Zealand as "well defined landforms of scientific/educational value".

587. The River is also described as a site of national significance in the Waimate District Plan. This status relates to significance in terms of plant and animal communities and habitats adjoining the River which contribute to section 6(a) and section 6(b) of the RMA values.

588. Despite modifications the River has a predominantly natural appearance and it is important recreationally and it is nationally significant for trout and salmon fisheries. It is also important for jet boating. We have referred to these values elsewhere in this decision.

589. The River is also an important source of spiritual and cultural value with historical and cultural associations for both Europeans and Tangata whenua. It contributes to a sense of identity and pride in the local community while to Ngai
Tahu it is an outstanding cultural landscape and taonga. It is also a valued native fishery and it is important because of its connectivity with Aoraki (Mt Cook). It is a central element of tribal identity and a source of Mauri. For these reasons it is classified as a statutory acknowledgement area in the Ngai Tahu Settlement Act and is so recognised, of course, as we have said in our decision on the NBTC case as such in the Allocation Plan.

590. However, despite all these values it is the opinion of Mr Rackham that this River is not an outstanding feature in terms of section 6(b) of the RMA. It has a highly modified flow regime and the physical landscape significantly reduces the natural qualities that would otherwise contribute to the River's assessment as an outstanding natural feature.

591. The Canterbury Regional Landscape Study assessed it as regionally significant and the valley was similarly assessed. In a Waitaki landscape study Graham Densem identified it as a regionally significant landscape feature. This study was prepared for the Waitaki District Council in 2004. It is Mr Rackham's opinion that assessing something as regionally significant is not the same as assessing it as regionally outstanding for the purposes of section 6(b) of the RMA and we agree.

592. Mr Rackham then went on to assess the effects of abstracting 20.5 cumecs from the River on the values we have just been discussing. He applied a comparative analysis based on the different flow scenarios that had been established through the work of Mr Henderson and Mr Searle that we have referred to earlier in this decision.

593. Now that we have decided to uphold the Allocation Plan's 150 cumecs minimum flow there is no need to consider Mr Rackham's evidence on the effects of HDI on the River and valley any further. We simply record that Mr Rackham concluded that the HDI Full 100cumec scenario was acceptable from a landscape point of view and it must follow therefore that an HDI Full 150 scenario would be the same. This general conclusion also held good for the combined effect of NBTC and HDI.

594. Mr Rackham then turned his attention to the effects on surface water bodies within the HDI command area and for his assessment here he relied on the evidence of other witnesses relating to physical and ecological information given by Mr Norton, Mr Ian Fraser, Mathew Ryan, Victor Mthamo and Ms Robertson.
and his own visual observations during a brief visit on 12 September 2007. He made the point that he did not address land based effects at this time because the application that is currently being assessed is for water only.

595. He said that the landscape of the command area is characterised by a number of small lowland or hill catchment watercourses that flow east to the coast, some near the Wainono Lagoon.

596. The upper catchments of the larger watercourses are in the Hunter Hills at elevations up to 1,500 metres. With the exception of the Pareora River, these watercourses are small with many having very low or non-existent flows particularly in the summer.

597. The presence of riparian vegetation is often the dominant visual characteristic of these small watercourses.

598. Mr Rackham said that it is his understanding that increased irrigation will lead to higher and more sustained flows in these streams and rivers. Water levels in the Wainono Lagoon may also increase above current levels. At present, low summer lagoon levels leading to an exposed lake bed are characteristics of the Lake particularly towards the end of the irrigation season.

599. Without mitigation measures employed by land managers, nutrient concentrations in surface water bodies will increase. Mr Norton estimated an increase in unshaded stony bottom rivers of nuisance periphyton. An increase in phytoplankton in the Wainono Lagoon is expected to be less noticeable. While periphyton growths in algal blooms could alter the water colour, such changes are unlikely to be easily distinguished by the casual observer. On the other hand small watercourses are likely to benefit with more constant flows and hence benefit the landscape.

600. Increased water levels in the Wainono Lagoon during the summer are also likely to be beneficial to the appearance of the lagoon as currently a large area of shallow lagoon dries out.

601. However, changes in water level have a potential to adversely impact on natural character and natural science values and may reduce the extent and composition of the low lying turf land community on the lagoon margins. Measures to reduce nutrient levels in the lagoon would minimise adverse natural
character and landscape effects but in the witness’s opinion, there is a net benefit to the lagoon.

602. Ms Bronwyn Judge, who also gave evidence at the NBTC hearing, gave evidence in these proceedings on her own behalf. She said that she was disappointed that the Allocation Plan had reduced the minimum flow from 230 to 150 cumecs and she was now concerned that the first two applications after the Plan had become operative were for non-complying activities. One of the Ms Judge’s concerns was that the Allocation Plan itself did not deal directly with water quality and she was concerned about the current poor state of water in the Lower Waitaki River. It is not suitable for swimming. There has been a steady deterioration over recent years. This, in her opinion, will increase with HDI. Her real concern was that the values of the River will be affected by this proposal.

603. Joanne Thomas-McLean told us again, as she had at the NBTC hearing, that the Lower Waitaki River has cultural significance for her and for those for whom she gave evidence. Her ancestors lived in this area for over 1,000 years before the first colonists arrived. She questioned how one can superimpose a statutory requirement of consideration on cultural requirements. She said that because the law tends to deal with facts this means it is inherently difficult to deal with and understand the intangible cultural needs. From a cultural point of view, it is not possible to separate the changes made to the Lower Waitaki River in “little bites” and deal with them as separate from the previous changes. Here we understood her to be saying that the cumulative effects are to be considered.

604. She went on to say that she and those she represented want the HDI consent declined because there will be an adverse effect in removing water from the Lower Waitaki River in the manner proposed. She said that she and those she represented have a “fiduciary duty” in this generation to protect their whakapapa and to remove 20.5 cumecs from the River will have a more than minor adverse effect on the environment of her people. It would diminish the mana of her people and irretrievably change the landscape.

605. Mandy Waaka-Hone, who also gave evidence at the NBTC hearing, expressed concerns about not knowing where the scheme is going, that is as a land use, with particular reference to canals and pipes. She was also concerned about the Wainono Lagoon and the 23 streams between the Waihao and Pareora Rivers with regard to what will happen to these waterways when didyno
comes from the Lower Waitaki River. On this matter, we understand didymo already exists in the Waihao River.

606. She said that if the HDI project was to go ahead, she would like to see a stringent package of mitigation conditions. She also said to us that she was not happy with the outcome of the Allocation Plan.

607. We note at this point that in our decision on NBTC we also referred to the evidence of some other witnesses who told us about their concerns regarding their spiritual values relating the River if that Scheme went ahead. In general we found that their values would not be adversely affected given the mitigation proposed and since, so far as the River is concerned, HDI is much lesser proposal in terms of its effects on the River the same conclusion applies.

Conclusion

608. We accept Mr Rackham's conclusions modified by us as regards the 150 cumecs regime. We are satisfied that HDI will have every little, if any, adverse effect on the landscape values of either the Lower Waitaki River or its valley. With regard to the command area we also accept Mr Rackham's assessment noting that this depends to some extent on mitigation proposed by the applicants. We also note that there is some dispute about whether the additional irrigation will in fact be beneficial or detrimental and we have addressed those matters in other sections of this decision.

609. On Maori values we accept as we did in the NBTC case that these are important particularly in terms of section 6 (e) of the RMA and we will address them more fully when we come to our overall assessment for the purposes of that sub-section and the other relevant provisions of the Act.

Hydrogeology in the HDI Command Area

610. The HDI command area of approximately 60,000 hectares located between Waimate and Timaru is bordered by Hunter Hills to the west and the Pacific Ocean to the east. Near the coast the land is typically low lying with areas of swamp/wetlands evident, particularly to the south in the vicinity of Wainono Lagoon. The surface water catchments to the north was characterised by the presence of an intermittent or perennial river or stream that have cut down into older fluvial fan deposits. Mr Fraser said that the older fluvial fan deposits consist of loess and weathered sand and gravel deposits that are generally resistant to
infiltration and erosion. This had created the existing landform of areas of lowlands that are associated with the present day rivers and streams of the Hunter Hills (i.e. floodplains), bordered by terraces of older more resistant alluvial and aeolian deposits, which comprised the so called downlands.

611. Rainfall isohyets across the command area are generally parallel to the coast, the higher rainfall around Waimate is in close proximity to the hills and the lower rainfall towards the coast.

612. Mr Fraser said that the geologic deposits of the scheme area between the Pareora and Waihao Rivers were dominated by younger Quaternary deposits, which include alluvial fans, terraces and floodplains, beach estuarine and swamp deposits, and extensive loess layers. He noted that loess thicknesses was greatest on older terraces (up to 20m thick), grading to 1-3m on the more recent terrace deposits. Recent alluvial deposits were present in the existing river valleys.

613. Up-gradient of the Wainono Lagoon there were silty clay layers below the topsoil of between 2m and 6m thickness and the thickness of the layers appeared to increase towards the east or towards the lagoon.

614. Mr Fraser said that along the western margin of the Scheme area, older geologic sequences are exposed between the Otaio River and the Pareora River. The surface outcrops of the Kowai formation in the Pareora and Otaio River catchments generally lie to the west of the Scheme area. However, an outcrop of Kowai formation gravels was also found in the lower reaches of the Makikihui catchment, and thin outcrops of Southburn Sands were present in the mid to upper reaches of the Otaio River catchment. At the western margin of the Scheme Area in the Pareora catchment outcrops of Otakaike Group and Kekenodon Group formations were present, and were associated with a change in the topography from a rolling hills nature to steep hill country.

615. With the exception of the areas of outcrop within the Scheme area, older deposits were overlain by either the loess deposits of the downlands, which restrict infiltration of water, or by the younger Quaternary alluvial deposits of the present day river valleys.

616. Mr Fraser said that there were two distinct geological units that form the main aquifers within the Scheme area. The first was the younger Quaternary alluvial deposits, which are found within the river valleys and coastal margins. The
second was the older Kowai formation, which provided a reliable source of groundwater for many users. The well depths associated with the Kowai formation were deeper than the alluvial gravel aquifer, and yields were typically lower than the Quaternary alluvial aquifer.

617. The geology of the downlands is predominantly low permeability clay and loess immediately below the soil profile. Infiltration of drainage water below the root zone is likely to be limited, to approximately 3mm/day. The downlands make up a significant portion of the scheme command area in all of the catchments north of Waimate. Mr Fraser assumed that 80% of drainage from the soils on the downlands drains laterally, discharging to ephemeral streams before flowing to the alluvial flats, rather than infiltrating into the deeper groundwater system. The remaining 20% of drainage water is assumed to either infiltrate through the downlands into the deeper groundwater system and / or pond in non-irrigated areas and subsequently evaporate.

618. River valleys, coastal areas, and the Waimate Plains are comprised of relatively young unconsolidated alluvium. Mr Fraser said that the shallow aquifers were generally associated with higher permeability sandy gravel deposits, the thickness of those deposits were between 2m and 20m, with the deposits thickening towards the head of the river valleys.

619. Those shallow unconfined aquifers generally had high specific capacity values, supported by high transmissivity and high storativity values. He believed that the main source of recharge to the shallow aquifers was the perennial or intermittent streams that had formed the river valleys.

620. Mr Fraser said that the deeper aquifer units of the Kowai Formation could be found underlying the majority of the Scheme area. Typically, wells penetrating the deeper Kowai Formation deposits were located in higher densities in and around Waimate, but it was noted that all catchments had some wells abstracting from this aquifer unit.

621. He said that the older deposits of the Southburn Sand and Taratu Formation within the Scheme area were generally only accessed by a few wells installed in the areas of outcrop.

622. The Taratu formation was not widely accessed by wells within the Scheme area, with the aquifer consisting of quartz conglomerate, sandstone, mudstone, and coal. He said that wells installed into that unit were low yielding, although
some had artesian conditions. Recharge pathways to this aquifer were unknown, with the outcrops the most likely source of recharge.

623. Mr Fraser considered that drainage to the deeper aquifers within the Scheme area was limited where they underlie the loess deposits or the near surface silty clays or the clay bound Cannington gravel materials. Therefore, he expected the shallow alluvial aquifers that are located adjacent to the present day rivers and streams would be the main receptor for any contaminants associated with the intensification of land use. It was within these alluvial deposits that the majority of the existing wells are located, and where the potential effects of land use change on groundwater quality would be most evident.

624. Mr Fraser said that the groundwater system in the Pareora River catchment was in the main within the alluvial gravels that formed the current floodplain of the River. The gravel aquifer was bounded by the less permeable Quaternary materials including significant thicknesses of loess which make up the downlands hill country.

625. Mr Fraser's opinion was that the Pareora River Valley shallow aquifer system was highly interconnected to surface water flows, with an obvious correlation between surface water flow and groundwater levels. Available geological logs showed that the alluvial deposits overlie thick layers of clay, with losses to the deeper aquifer likely to be restricted by the presence of those clay layers.

626. Mr Fraser said that the groundwater system of the Otaio River catchment was contained within a shallow unconfined aquifer associated with the Quaternary gravel deposits of the river valley.

627. Mr Fraser believed that given the alluvial deposits that are present in the lower Makikihi River it was likely that losses to groundwater occur in the mid to lower reaches of the river although there was only limited gauging data to support that view. There were also six wells installed to depths more than 70 metres, likely to be abstracting from the Kowai formation aquifers.

628. The Waihao River catchment was the largest foothills catchment in the area (541 square kilometres) between Waitaki River in the south and Timaru in the north.
629. There was little information available on the groundwater system that is present within the Scheme Area of the Waihao Downs. Mr Fraser's opinion was that an extensive groundwater resource was unlikely to be present due to the bedrock and weathered alluvial geology.

630. There are relatively few active wells installed in this area, with the majority of those installed to less than 10m deep (or to an unknown depth). The shallow wells are typically adjacent to a surface water source.

Existing Water Abstraction

631. Mr Fraser said that in the past, surface water takes within the scheme area have been the main source of water for irrigation, stockwater, and potable uses. However, in the last ten years the volume of water authorised to be taken from wells within the scheme area has increased markedly so that currently the majority of the water (69% of 412,924 m³/day) was sourced from groundwater.

632. Mr Fraser said that there were 261 active wells within the scheme area between the Waihao and the Pareora rivers excluding water quality and observation wells. Of those wells, approximately 56% were installed to depths less than 10m, and considered to abstract from the shallow Quaternary gravel aquifers. The likely use of the wells is domestic and/or stockwater under the general authorisation of the Transitional Regional Plan.

633. Properties located on the downlands in the main obtained their potable water from either the "Downlands" rural reticulated supply, or rainwater (or a combination of both), as there were few wells located in that area.

634. Surface water takes and hydraulically connected groundwater takes within the surface water catchments account for a total of 3.4 cumecs. Within the majority of the catchments the surface water resources are under considerable pressure, and most are restricted during the summer months.

635. Mr Fraser's opinion was that further significant development of water resources within the Scheme Area was unlikely given the stress the surface water and groundwater resources are already under.

636. Mr Fraser said that the predominant land use within the Scheme Area was horticultural or agricultural activities, with the majority of the land not irrigated. Sheep and arable land use activities occupy over 50% of the Scheme Area.
637. Colin Hurst a management committee member of the Waihao Wainono Water Users Society presented evidence on behalf of the Society. He is also chairman of the Waimate branch of Federated Farmers, a Director of the Foundation for Arable Research and a member of the St Andrews School Board of Trustees.

638. He farms in partnership with his father. He said that the farm was 680 ha of which 360 ha was used for crops (wheat, barley, grass seed, brassica seed and clover seed) from which they derive 80% of their income. The remainder of the farm supports 2300 mixed age ewes and 500 hoggets with 35 ha of forestry. The farm currently has no irrigation and stock water is derived from a community scheme.

639. Mr Hurst said that his evidence was based on his personal experience and an on-farm case study to demonstrate the social and economic benefits to individuals and the community that would be available from access to water for irrigation purposes, from the Hunter Downs Irrigation Scheme.

640. Mr Hurst said that the ground water resource of the Hook, Makikhi, Pareora, and Otaio were all considered to be either fully or over allocated and the available surface water was either fully allocated or unreliable with most of them going dry over summer months. He believed that their only possible source of water for irrigation in the area was the Lower Waitaki River.

641. Mr Hurst noted that wheat and grass seed yields had doubled since 1986. Increased yields were the result of canopy management, or refined timing and use fertiliser and fungicides. He said that while these factors have been successful in achieving higher yields, reliable water was critical to achieve those results consistently from year to year.

Conclusion

642. There are two main aquifers systems within the Scheme Area. Firstly the younger Quaternary alluvial deposits, which are found within the river valleys and coastal margins and generally have high specific capacity values. Unfortunately the main source of recharge to the shallow aquifers is the perennial or intermittent streams that formed the river valleys and those streams are already under considerable stress.

643. Secondly the older formations not widely accessed by wells within the Scheme area, consisting of quartz conglomerate, sandstone, mudstone, and coal. Wells abstracting from that unit are low yielding, although some
have artesian conditions. Recharge pathways to this aquifer are unknown, although outcrops are the most likely source of recharge.

644. The hydrogeology confirms that further significant development of water resources within the Scheme Area is unlikely given the stress the surface water and groundwater resources are already under.

Drainage within the HDI Command Area

645. The main hydrological effect of the HDI arises from potentially elevated water table conditions within and adjacent to the scheme command area as a result of the application of water for irrigation. The increased water table within lowland areas could require additional land drainage to ensure any existing drainage problems are not exacerbated. Base flows are expected to increase in rivers and streams draining the HDI command area.

646. The applicants identified the area in the vicinity of Wainono Lagoon as a critical area in terms of this potential effect, and commissioned a study to investigate the potential effects on drainage and flood risk for this area.

647. Much of the land surrounding Wainono Lagoon is low-lying (~ RL 2 m), and bears evidence of intermittent flooding and near-surface groundwater levels. Management of water levels in the Lagoon, into which much of the surrounding area drains via man-made drains, is apparently critical to prevent surface inundation during periods of high rainfall.

648. Victor Mthamo is a Senior Environmental Engineer with Duffill Watts Consulting Group (DWG), and has worked in the area of irrigation engineering and management for over 13 years. He holds a Bachelor of Agricultural Engineering (Honours) and Master of Engineering Science in Water Resources.

649. Mr Mthamo said that his approach and methods adopted for his study were influenced by the agreed scope of work. He used climatic and hydrologic data for the area sourced from the Regional Council. Both the quantity and quality of the data was variable.

650. After reviewing the first step results, Mr Mthamo decided that the small increase in flows resulting from implementation of HDI, coupled with the lack of reliable calibration data, did not warrant a more detailed hydrologic and hydraulic analysis of the study area. He therefore estimated the relationship between rainfall and runoff based on a simple water balance equation to model changes in
soil moisture after a rainfall event. Only rainfall events greater than 5 mm were considered effective.

651. Mr Mthamo said he adopted an expected maximum summer increase of +8% precipitation to account for the effect of climate change. He also adopted a crop coefficient of 1.0 so that potential evapo-transpiration (PET) was equal to actual crop evapo-transpiration and assumed that daily PET takes place at a constant rate over a 12-hour period.

652. He then carried out soil infiltration tests at seven sites on representative soil types across the study area. At two sites with known fragipans (compact, deep subsoil layers), he removed the top soil and undertook the tests on the fragipan surface to assess the effect of the clay layer on soil infiltration. At all the other sites, he performed the infiltration tests on the ground surface.

653. He said that the initial infiltration rate for all the soils tested (with and without fragipans) ranged from 12 - 84 mm/hr reflecting the different antecedent soil moisture conditions (AMC) across the seven sites and the average final infiltration rate was 3.4 mm/hr. The final infiltration rates at the measured sites ranged from 1.16 mm/hr for all soils. The lower infiltration rates were observed at sites with fragipans.

654. Mr Mthamo said he then calculated the runoff coefficients for different antecedent moisture content scenarios and storm durations by dividing the runoff by rainfall.

655. Mr David Leong a co-author of the 42A report for this application was concerned about the manner in which infiltration was addressed. He said that given the spread in the field data, it was tenuous to attempt to represent the infiltration characteristics of the soils with a single value for the initial (15 mm/hr) and final (3.4 mm/hr) infiltration rates. He said graphs showing the assumed relationships between infiltration capacity, initial soil moisture and cumulative rainfall were not provided. Thus, it was unclear how well the field measurements fit the assumed infiltration characteristics, and how the information has subsequently been used to assess runoff thresholds.

656. Mr Mthamo also said that it was his experience with infiltration (or any soil related work) that for a given soil if one takes ten infiltration measurements within a 100 m² area one could get 10 different results. He believed, experience and judgment should be used to determine the best values. For an area as large as
the study area, the method suggested by Mr Leong would require an unnecessarily large amount of data.

657. Mr Mthamo agreed that it was difficult to represent the infiltration characteristics of the soils with a single value so he adopted a conservative approach by using a final infiltration of 3.4 mm/hr. He also assumed an infiltration rate of zero for saturated soils because low infiltration rates increases the runoff component.

658. Having established the runoff coefficients, Mr Mthamo said his next task was to calculate the peak flows and using those to estimate the increase in runoff flows and volumes resulting from the operation of the HDI. To do that he used a common empirical hydrological procedure called the Rational Method.

659. Mr Leong was quite critical of the use of the Rational Method: He said:

The rational method adopted in the analysis \( Q = kC_iA \) is a simplistic and empirical method, and quite inappropriate for hydrologic analysis in which infiltration rates have to be input as a variable, whether constant or time-varying. It is unclear how the runoff coefficient \( C \) in the rational method has been related to the antecedent soil moisture and infiltration rate (if in fact the standard form of the rational method has been used). The point to note here is that there are other more appropriate rainfall-runoff models that are able to take into account infiltration and initial moisture content.

660. Mr Mthamo justified the use of the Rational Method because the lack of suitable historical rainfall/runoff information, linked in time with river flow data and flooding inundation data, prevented the use of a more comprehensive rainfall/runoff model. Such a model would also have required calibration with historical data.

661. However, Mr Leong’s review of the available water level gauging sites in the general vicinity, (Walter, 2000) indicated the existence of six recorders, with at least one site having more than 20 years of flow data (Waihao at McCulloughs Bridge, data 1982-present). A water level recorder was also established at the downstream end of the Hook River in 2001 to specifically measure inflows to the Wainono Lagoon. He added that while a review had not been undertaken, rainfall stations typically have more abundant coverage than flow recording sites, both temporally and spatially, and do not generally limit the availability of calibration data.
662. Mr Mthamo agreed that the Rational Method was a simple empirical method and that its adoption was dictated by the scope of his analysis. He said that it was his understanding that the total drainage rates in the Wainono District were currently in the region of $60,000 per year and a detailed hydraulic/hydrologic model would cost tens of thousands of dollars.

663. He went on to explain that it was the applicants desire to get an understanding of the drainage impact that HDI would have in the area. Mr Mthamo was convinced that the Rational Method offered a good first step towards achieving that. He acknowledged it did have shortcomings like any other model. Some of these shortcomings were:

i. the model did not directly account for micro-storage in the catchments and
ii. it assumed rainfall intensity would be uniform across a catchment, which may not be so in large catchments. However, by not accounting for storage, the method assumed all runoff ends up in the rivers and creeks and eventually in the lagoon area thus effectively it overestimated the runoff component.

664. Mr Mthamo said that Mr Leong's main concern with the use of the Rational Method was that it did not account for changes in infiltration with time but that the runoff coefficients had been derived using time stepped changes in infiltration rate, based on soil intake curves and field infiltration data.

665. Mr Mthamo said that in using the Rational Method he had to first calculate the time of concentration (Tc) which is the time required for water to travel from the most hydrologically remote point in the sub-catchment to the point of collection. He estimated the time of concentration varied from 1-5 hours for the smaller catchments and was approximately 10 hours for the Waihao Catchment.

666. Mr Mthamo said that the computed times of concentration compared well with rainfall duration information obtained from literature reviews. For example, he said the calculated Tc of 10 hours for the Waihao Catchment compared well, in hydrological terms, with the observed durations of two storms that caused flooding in recent years (1986 and 1994) in the Catchment. He therefore adopted a Tc of 12 hours to estimate peak discharges for the Waihao sub-catchment.

667. Mr Leong in his review queried the use of the 12 hour time of concentration. He said
"It is noted that the other catchments assessed in the report are significantly smaller than the Waihao River, and thus should have Tcs of less than 12 hours. Yet the 12 hour rainstorm has been retained as the basis for computing the 50 year return period peak flows. Again, this does not accord with the rational method approach, which requires the storm duration to match the time-of-concentration."

668. Mr Mthamo said that there was an infinite combination of storm durations and flows that could be analysed for ascertaining the effect of the HDI. The worst case in his opinion seemed to be the one where all the catchments under consideration were contributing to the lagoon. This occurred, he said, after at least 12 hours when the larger Waihao catchment attained its critical duration.

669. Mr Mthamo said where possible he had compared the design flows he calculated with data from previous studies. His calculated peak discharge for the worst case scenario from a 50 year, 12 hour duration storm for the Waihao Catchment was 1,019 cumeecs which he thought compared reasonably well with the Waihao stop bank design flow of 975 cumeecs. These flows also confirmed that a Tc of around 12 hours was likely to be the critical duration for the Waihao Catchment, but the lack of storm duration data for the other catchments, prevented him from correlating their critical storm durations with any confidence.

670. To estimate the effect of the HDI on peak flows he compared the following:

i. The flow generated when the HDI area is fully saturated and the area outside HDI is dry; with,

ii. The flow generated if the whole catchment was dry (i.e. soil moisture for both HDI and non-HDI is less than or equal to 25% of plant available water (PAW)).

671. Mr Mthamo estimated the increase in flow rate and volume was would be up to 6.2%.

672. He said that the main factors determining the magnitude of the increase were:

i. Soil moisture conditions at the start of a rainfall event.

ii. Under the current scenario, without the HDI, if the area is dry and rain occurs, runoff does not occur until the optimal conditions are reached.
iii. HDI would be managed to maintain the soil moisture in the range 25 - 75% of PAW and should a rainfall event occur soon after irrigation, the irrigated soils will produce runoff sooner than the rest of the catchment.

673. For his hydraulic analysis Mr Mthamo said that he used the HEC-RAS programme which was a one-dimensional steady and unsteady flow water surface model. The model predicted most of the small creeks would, as expected, overtop but that the Waihao River profile showed that the existing infrastructure would contain the extra flow increases from the HDI.

674. The water level difference with and without HDI was minimal, leading him to conclude that the HDI would not significantly alter the extent and magnitude of the flood hazard risk within the water channel margins.

675. He said that he was not able to analyse the extent of inundation and flood levels outside the river margins. Also that there was no baseline data available for assessing these levels of inundation but it was his opinion that the main determinant of the extent and duration of flooding would be the operation of the Waihao Box.

676. Again he said, it was his opinion that as long as the box is operating normally, if it takes say two days for the drainage water to be removed without HDI, he expected the extra flow with HDI may also be removed within the same time frame assuming the conditions did not change.

677. Mr Mthamo said that in the first phase of the study he showed that the scheme had the potential to increase peak flows and volumes by just over 6% depending on antecedent soil moisture. The next phase of his study assessed whether the introduction of the HDI would result in more frequent flood events.

678. He said he developed a spreadsheet model to simulate runoff in the area draining to the Wainono Lagoon. The spreadsheet was a water balance model based on 5 years of historical data (June 2001 to September 2006) for the catchment area. From the results he predicted that HDI may result in more runoff events than the without-HDI scenario. But those additional runoff events would be small, less than 30 cumecs over the total catchment area, and thus would not cause flooding.

679. Because a number of assumptions were involved in the analysis he said that he performed a range of sensitivity analyses to quantify the effect, on the results,
of different assumptions in the key model parameters adopted. Also he recommended increased monitoring of water levels, groundwater levels and the operation of the Waihao Box. The monitoring would increase the data available for future model calibration and could also be used for monitoring the drainage effects of the HDI.

680. Mr Leong in his section 42A report commented on Mr Mthamo’s conclusion that the increased moisture content within the HDI area was inconsequential to runoff because the area represents a small fraction of the total catchment area.

681. "while this may be true at the outlet of a sizeable catchment (where the total contributing area is a maximum), there will be numerous smaller watercourses and drainage channels which have catchments affected by the HDI to a greater extent. The increase in peak flows and flood risk for these watercourses may be considerably more significant”.

682. Mr Leong also questioned why the hydraulic analysis was carried out:

*If the prediction of the modest increase in flow rate and volume is correct, then there appears little point to carry out a complementary hydraulic analysis because:

- typically, such a small increase in flow corresponds with an even smaller increase in flood level

- such a small flow increase should be well within the typical uncertainty limits of flood flow estimates

- in managed watercourses and stopbanked channels, the design freeboard allowance would be more than sufficient (typically) to accommodate such a modest flow increase

683. Mr Mthamo said that the purpose of the hydraulic analysis was to provide a visual display of the flows cross sections within the main channels. The cross sections do show that Waihao River will be able to contain the 50 Year runoff within its flood protection infrastructure while all the smaller streams will overtop, this was expected as the flood infrastructure for these is designed for short return periods (e.g., 10 Year interval for the Waimate Catchment).
684. He also said that lack of measured flood level data outside the stream channels precluded the calibration of the model outside the channel boundaries. However an analysis of historical rainfall data showed that the proposed HDI would increase the likelihood of runoff events in the area, with the number of events expected to be approximately double. But an analysis of the size of those events showed that most of them were small.

685. Mr Leong said in summary:

"given the numerous misconceptions, inconsistencies and major omissions in this report, there is no confidence in the analysis presented in the GPF report and thus in the assessed effects on drainage and flood risk resulting from the HDI. In my opinion, little regard should be given to the conclusions made in the report unless the shortcomings outlined in this review have been addressed.

It is likely that the increase in the runoff rates and flood risk in the watercourses which drain the HDI scheme area have been underestimated."

686. Ian James Heslop is the Design & Operations Engineer with the Engineering Section of Environment Canterbury. He holds a Bachelor of Engineering (Agricultural) and is a Chartered Professional Engineer. He has 27 years professional work experience mainly in flood protection and drainage.

687. He said that the Regional Council administers and maintains community flood protection and drainage rating districts within South Canterbury. A number of those could be affected by the HDI. Those districts are the Pareora, Otaio, Esk Valley, Lower Makikihi, Lower Hook, Wainono, Lower Walmate Creek, Kapua Drain, Lower Waihao, and Lower Waitaki. With the exception of the Lower Waitaki, all of these districts had part of the HDI command area within their catchments.

688. Mr Heslop said that his concern in the Pareora and Otaio rating districts, was that the HDI will encourage farmers to remove trees, established along river banks and berms for flood protection purposes, to increase available irrigable farmland. This problem was being experienced elsewhere in Canterbury, where either through under-estimation of the value of protective plantings, or commercial expediency, farmers had cleared riverside vegetation.

689. Following discussions with Brian Ellwood (Meridian), although not an issue directly related to the take and use consent Mr Ellwood undertook to consider the
possibility of addressing this issue within the generic Farm Management Plan and at forums. Mr Heslop agreed with that approach.

690. Mr Heslop then listed a number of general concerns he had that the HDI could;

- Increase the frequency, peak flow, and volume of flood and drainage runoff events.

- Increase the frequency with which flood protection and drainage system design capacities are exceeded.

- Increase drainage runoff into, and raise groundwater levels within, low lying farm land along the fringes of the Wainono Lagoon and Waihao Dead Arm.

- Increase the frequency and duration of operation of the Waihao Box.

- Increase Waihao Box maintenance requirements, and vulnerability to wave damage during heavy seas.

- Increase nutrient leaching and silt runoff, and reduce groundwater and surface water quality, particularly within and around the Wainono Lagoon.

- Increase nutrient and silt related weed growth and maintenance requirements within drains and floodways.

- Reduce the economic viability of farm land reliant on communal drainage schemes.

691. He then discussed how each of the rating districts may be affected.

Pareora Rating District

692. The scheme area is a comparatively small proportion of the overall catchment area so he did not expect HDI to significantly increase the size or frequency of flood flows in the main river channel.

693. He expected HDI to increase the risk of stock damage due to pugging, and introduce the need for herbicide spraying. In his view arrangements were required for the scheme to fund the additional costs for the grassed waterway maintenance.
Otaio, Esk Valley, Lower Makikihi, and Kapua Rating Districts

694. Implementation of HDI was not expected to significantly reduce rating district service standards or increase maintenance costs in those districts.

Lower Hook Rating District

695. Mr Heslop said that the Lower Hook rating district's objective was to prevent flooding by the Hook River of approximately 140 ha of land on the eastern side of SH1. The flood control system consists of protective plantings and low stopbanks along the Hook River between SH1 and the Wainono Lagoon, with a flow capacity of 32 cumecs at an estimated 5 year return period. He said that based on Mr Mthamo's evidence, 32% (22.7 km²) of the total catchment area was in the HDI scheme area.

696. The Hook catchment had a relatively short time of concentration (estimated at about 3 hours), and short duration-high intensity rainfall events, particularly if the soil moisture is high from recent irrigation, would be the most likely to produce large flood flows. With HDI he expected the Hook River to overflow with a greater frequency than the current 5 year return period design capacity.

697. He also said that there are no continuous flood flow records available for the Lower Hook River, and without a whole of catchment rainfall / runoff and river channel hydraulic modelling study it was not possible to define the impact of HDI. He believed such a study should be carried out by HDI.

Wainono Drainage District

698. The Wainono drainage district was established to provide community oversight of drainage to the area from Makikihi to the Wainono Lagoon via Hook Swamp Drain, and to provide a drainage outlet for the Wainono Lagoon via the Dead Arm, an outlet for the Waihao River, and a coastal outlet to the Dead Arm via the Waihao Box. The total rated area within the drainage district is 2,560 hectares.

699. The drainage district carries out herbicide weed control, machine cleaning, and tree removal from the Hook Swamp Drain and Dead Arm, as well as the maintenance of the Waihao Box.

700. Mr Heslop said that annual maintenance costs for the Waihao Box is a major expenditure item for the district. Box maintenance requirements are directly related to the number of openings, as influenced by drainage and flood flows.
701. The HDI was expected to increase the duration and frequency of Waihao Box openings, and the vulnerability to significant wave damage from heavy seas. He sought that HDI install a water level recorder near the Waihao River mouth, and remote monitoring by digital camera of the box condition.

702. Mr Heslop said that the productivity of low-lying land surrounding the lagoon depends heavily on the standard of drainage provided. In the event of the farm land serviced by the drainage district becoming waterlogged or flooded more frequently, or for longer durations, this farm land could become less economically viable. The very low drainage gradients, and the dominating influence of the Waihao Box water levels at the southern end of the Dead Arm, he said make it unlikely that further rises in the water table could be addressed by drainage system upgrading. His concern was other options may not be economically viable or ecologically acceptable.

**Lower Waimate Creek**

703. The Lower Waimate Creek scheme consists of an open grassed channel with stopbanks, extending from the Main South Rail Line to the Dead Arm, to contain a 42 cusec flow with an estimated ten year return period. Also included are culverts with floodgates to provide drainage from the adjacent land through the stopbanks. Based on Mr Mthamo's evidence, 21.4 km² (30%) of the catchment area is within the HDI scheme.

704. The Waimate Creek catchment has a relatively short time of concentration (estimated at about 3 hours) and is therefore susceptible to flooding from short duration-high intensity rainfall events.

705. Mr Heslop expected the Waimate Creek to overflow with a greater frequency than the current 10 year return period design capacity if HDI is implemented and he sought a whole of catchment rainfall / runoff and river channel hydraulic modelling study carried out by HDI to determine the potential effect of HDI on flooding.

**Lower Waihao River**

706. Mr Heslop said that the Lower Waihao River Flood Control Scheme was established to prevent flooding by containing floods up to 975 cusecs (an estimated 50 year return period) within the riverbed downstream of State Highway 1, and to prevent loss of farmland from lateral bank erosion.
707. He did not believe HDI would significantly increase the size or frequency of flood flows in the main river channel for the following reasons;

- The scheme area is a small proportion of the total catchment area, and is located in the lower part of the catchment.

- Relatively long duration rainfall events are required over the whole catchment area to produce flooding; and,

- The HDI command area is likely to be saturated, whether or not under irrigation, by the time it contributes to the peak flood flow.

708. He then said that HDI was however likely to increase the volume of floodwaters contributed to the Wainono Lagoon catchment. This may increase lagoon levels and the frequency of operation of the Waihao Box.

709. Mr Heslop said that he had reviewed the *Hunter Downs Irrigation Scheme Drainage Requirements Analysis in and Around the Wainono Lagoon* report, and met with Mr Potts and Mr Mthamo together on one occasion, and with Mr Mthamo on two further occasions, to discuss the content, methodology, and conclusions of that report.

710. He said that he did not accept that report, or Victor Mthamo's evidence, adequately addressed the stated objective of "Estimating the effect of HDI on flooding and drainage in and around the Wainono Lagoon". The dynamics of the Wainono Lagoon, Dead Arm, and Waihao River outlet (Waihao Box), and related flooding and drainage issues were very complex, and were not adequately dealt with by the hydraulic modelling methodology adopted.

711. Mr Heslop disagreed with the statement that "on average the increase in flow rate and volume is expected to be 0-6%". Although this conclusion may be valid for the larger catchments such as the Pareora, Otaio, and Waihao, his judgement and experience lead him to expect a more significant increase for the small catchments; such as those draining into the Wainono Lagoon via the Lower Hook Wainono, and Lower Waimate rating districts.

712. He said that the report concluded that "the increased moisture content within the HDI area is inconsequential to runoff because the area represents a small fraction of the total catchment area". Again he believed that it may be true for the
larger catchments, but he disagreed with this statement for the small catchments draining into the Wainono Lagoon and Dead Arm.

713. The report concluded that "the proposed HDI will increase the likelihood of runoff in the area. The number of runoff events is expected to be approximately double. However not all runoff will produce flooding". Mr Heslop said he could accept those general statements, he believed that more frequent runoff events would result in more frequent overflows of the relatively low capacity drainage systems servicing the farmland around the Wainono lagoon, and could increase Waihao Box maintenance requirements. He considered the lack of a statement addressing those issues was a serious omission in the report.

714. Mr Heslop also noted that there are published records that the water level in the Wainono Lagoon (at Poingdestres Road) exceeded 2.0 m AMSL, and encroached significantly onto adjoining farm land on 10 occasions over the 20 year period from 1986 to 2006. He believed the agricultural viability of the low-lying land within the Wainono Drainage District was very dependent on the successful ongoing performance of on-farm and communal drainage systems. He also believed that a minor change in water table level, and/or upland drainage runoff volumes and frequency, could have a significant adverse effect on the ongoing agricultural viability of this land.

715. Mr Heslop noted that in Mr Fraser's evidence, he states that:

"the area with the most potential for adverse effects associated with an increase in groundwater levels is the lowland area in the vicinity of the Wainono Lagoon" and he further states that "Increasing maximum groundwater levels by 0.5 to 1.6m will likely go unnoticed over the majority of the Waimate lowlands as current groundwater levels are in excess of 5m bgl. However in the vicinity of the lagoon a groundwater level rise of this order has the potential to increase the area of wet land, potentially requiring additional drainage to be put in place to manage problem areas". Finally Mr Fraser states that "...the increase in groundwater level may require additional drainage works to avoid adverse effects to farmland in the vicinity of the Lagoon".

716. It was Mr Heslop's opinion that this evidence is inconsistent with Mr Mthamo's evidence regarding the potential effects on low-land drainage.

717. Mr Heslop said that Mr Fraser's evidence also states that:
"I recommend that a monitoring plan be put in place that will identify the location, sampling and water level monitoring frequency, and any analysis which will be undertaken at the proposed monitoring wells and surface water monitoring sites. The locations and monitoring frequency should be agreed in order to provide a comprehensive record of spatial and temporal changes that occur in groundwater level and water quality prior to construction, during commissioning and during the consented period of the HDL."

718. He agreed with Mr Fraser's statements and believed that the water level and quality monitoring regime should be implemented by HDI, starting as soon as practicable to give as long as possible base line record before HDI implementation.

719. Julia Laming is the Secretary and Facilitator of the Waihao Wainono Water Users Society. She spent the first 18 years of her life on a farm in Studholme, adjacent to the Waihao River, and Sir Charles Creek, a major tributary of the River. She is a Resource Care Coordinator at Environment Canterbury in Timaru. She holds a Bachelor of Applied Science degree.

720. She said that the Waihao Wainono Water Users Group was established in 1999, and comprised farmers, residents, water users and the local runanga. The group was supported by the Regional Council, and assistance was also provided by the Department of Conservation, Fish and Game, Waimate District Council and Federated Farmers.

721. A steering committee publicly elected in 2006, had a mandate to draft a non-statutory management plan for the entire Waihao Wainono catchment.

722. Michael Laming has been a member of the Waihao Wainono Water Users Group since it began in 1999 he is also the Chairman of the Wainono Drainage Committee.

723. He has farmed a mixed sheep, beef and cropping operation in Studholme, next to both the Waihao River and the Sir Charles Creek for the last 30 years and had a sound first-hand knowledge of the river system.

724. He said that the prime responsibilities of the Waihao Drainage Committee were the maintenance of the Waihao Box which is pivotal to providing satisfactory drainage and the maintenance of the drainage channels both between Lake Wainono and the Box and also into Lake Wainono from the Lower Hook area.
725. The Box was constructed in 1908 by locals using voluntary labour. Construction took 2 years in very trying conditions. Over subsequent years various issues have impacted on the drainage system, the greatest being the accelerated erosion of the protective barrier beach caused he said by hydro development on the Waitaki River. This issue has resulted in increasing maintenance on the Waihoa Box and the drainage channels.

726. He said that the Society's major concerns with HDI were:

- Increased runoff and more frequent flooding events which would impact on the frequency of Box openings increasing Box maintenance.

- Increased groundwater flow and raised water tables which would impact on the drainage system.

- Increased weed growth in drains and ditches due to increased nutrients in the water requiring more frequent drain maintenance.

727. Mr Laming said that the Society's own experience with the limited amount of irrigation within their catchment was that the effects of irrigation on runoff following rain were significantly more pronounced than indicated by the applicants. Small rain events cause noticeable freshes in associated waterways and streams.

728. Mr Laming then drew attention to Mr Leong's assessment in his section 42A report that the analysis and report undertaken by Glasson Potts Fowler had:

"numerous misconceptions, inconsistencies and major omissions and that little regard should be given to its conclusions. It is likely that the increase in runoff rates and flood risk in the water courses which drain the HDI scheme area have been underestimated".

729. He said the Society agreed with the suggestions of Mr Leong and Mr Hughes that the capacity of the existing drainage scheme should be increased to provide for increased base flow, and that there should be additional land drainage works to reduce the potential for periodic inundation of low lying land because of elevated water table conditions from irrigation water.

730. In conclusion he said that he would like to reiterate that they do not necessarily wish to hinder irrigation development but feel that they must insist
that the anticipated effects on their drainage system are satisfactorily addressed both by mitigating works and maintenance funding.

Conclusion

731. We note that there may at times be conflict between the high groundwater levels maintained by irrigation and the objectives of the drainage and flood protection works particularly in the low lying coastal areas.

732. We have concluded that there will be a small increase in the frequency, peak flow, and volume of flood and drainage runoff events which will lead to increased drainage runoff into, and raise groundwater levels within, low lying farm land along the fringes of the Wainono Lagoon and Waihao Dead Arm. This will result in an increase in the frequency and duration of operation of the Waihao Box and higher groundwater levels may require additional drainage works to avoid adverse effects to farmland in the vicinity of the Lagoon.

733. Because of the non-uniform nature of the groundwater rise it will be necessary to put in place a monitoring programme to accurately determine the mitigation required. Should additional drainage works, flood protection, and box maintenance be required to mitigate the effects of the scheme, the cost of reclassifying the drainage district to include the exacerbaters would be part of the mitigation and would be borne by the exacerbaters or in other words the users of the HDI scheme.

Effects of Irrigation in the Command Area and Wainono Lagoon

734. Mr Fraser explained that the irrigation of pasture and crops as proposed under the HDI would result in greater productivity and more intensive land use. While that had many economic benefits, there was also the potential for adverse effects associated with changes to the quality and quantity of ground and surface waters within local catchments, with potential flow-on effects to the local ecology of streams and Wainono Lagoon. We have already addressed drainage and water quantity. In this section we address the issue of water quality and ecology.

Ground and Surface Water Quality

735. We begin this section of our decision by outlining the relationship between land use and nutrient losses to water. Mr Fraser stated that the primary concern
from land use intensification was the potential increase of nutrient leaching into groundwater and runoff / discharge to surface water bodies. The effects of the proposed irrigation scheme on water quality are principally associated with nitrate-nitrogen (NO₃-N). Nitrate is susceptible to leaching and the potential for this to occur can be increased through a variety of agricultural practices, including ploughing, urine from stock and fertiliser application.

736. Mr Fraser also explained that the use of phosphate based fertilisers to support increased stocking rates had the potential to result in increased phosphorus concentrations in receiving waters.

737. The majority of phosphorus (P) that was lost to surface waterways was via overland flow, with groundwater known to contribute only a very small component of the total P losses. As a result he believed that the primary potential mechanism for P transport associated with the HDI would be surface runoff, arising from saturated soil conditions aided by the slopes of the downlands.

738. Mr Fraser said that the consequences of increased nutrient loads could be divided into two types of effects;

i. The toxicity effects of nitrate on human health and aquatic fauna.

ii. The nutrient enrichment effects of both nitrogen and phosphorus (i.e., eutrophication manifested as proliferations of algae and reduced dissolved oxygen concentrations in relevant waterways).

739. Increased stocking rates associated with irrigated pasture also had the potential to cause microbial contamination of surface water and groundwater resources. Mr Fraser explained how the potential for microbial contamination was influenced by the irrigation method, soil and aquifer characteristics as well as on-farm management practices such as riparian buffers.

740. Mr Fraser then explained that the water quality assessment for the HDI had utilised a mass balance spreadsheet model to predict nitrate concentrations within groundwater (and surface water). The modelling relied on a range of inputs and assumptions and required a robust understanding of the current hydrology, hydrogeology, existing and proposed land use and existing water quality such that the inputs can be appropriately allocated.

741. The mass balance model utilised in this assessment had also been checked by comparing the output for the existing land use with the available current day
groundwater and surface water quality data. For that reason he thought it was essential to have a thorough understanding of the existing conditions within the catchments which have formed the basis of the mass balance modelling.

**Existing nutrient status of ground and surface waters**

742. Mr Fraser said that identifying the existing conditions within the sub catchments of the Scheme area was key to the assessment of effects on water quality associated with the potential implementation of the HDI.

743. He said that, in general, there was limited information available on the quality of surface water within the Scheme Area. Also most of the available data was focused in and around the Wainono Lagoon. NIWA had conducted weekly surface water sampling during the 2006/2007 summer to extend the available data. Mr Fraser provided descriptions of existing land use and water quality in each catchment within the command area and his analysis is summarised in the following sections.

**Pareora catchment**

744. In the Pareora catchment, different land uses are present across the Pareora alluvial gravels adjacent to the river, with irrigation being applied on more than 54% of the river flat area. However, only 7% of the downlands area south of the Pareora River is estimated to be irrigated.

745. Concentrations of nitrate in groundwater have been recorded in a number of shallow wells located within the Pareora alluvial gravels. The mean nitrate concentration within the wells range between 0.68 g/m³ and 3.95 g/m³. Surface water quality sampling undertaken by Environment Canterbury at three main locations below the Huts Recorder site on the Pareora River found concentrations of nitrate within the mainstream of the Pareora River were low.

**Otaio catchment**

746. The majority of the land within the Otaio River catchment (within the Scheme Area) is classified as dryland pastoral farming- a total of 2,681 hectares of which 66% is located on the downlands. Arable farming occupied 1,338 hectares of which 56% is irrigated. Mr Fraser said that this catchment was distinct insofar as there was little if any dairying present and currently only 24% of the catchment was irrigated.
747. Mr Fraser considered the Otaio catchment best represented shallow groundwater quality associated with dryland farming practices. Groundwater and surface water quality within this catchment is characterised by very low nitrate concentrations. Sampling had been carried out between 1998 and 2002, and the mean nitrate concentration in groundwater is 2.5 g/m$^3$.

748. The mean nitrate concentration in the Otaio River at SH1 is 0.63 g/m$^3$. This indicated in Mr Fraser's view that the surface water discharging from the catchment at SH1 contained very little nitrate, despite the lower reaches of the Otaio River being recharged from the shallow groundwater system. He said that there were few long term water quality datasets available for this catchment. Spot samples had been taken at various sites all of which except one exhibited nitrate concentrations below 1 g/m$^3$.

**Makikihi catchment**

749. The majority of the land (some 80%) within the Makikihi catchment is dryland pastoral farming. Irrigation within the catchment is limited, with approximately 450 hectares irrigated out of a total of 5,864 hectares.

750. The concentration of nitrate measured in groundwater within the Makikihi River catchment is low. However, the number of records is small and regular ongoing monitoring is generally absent. Spot samples of both groundwater and surface water have been taken at a number of locations throughout the valley, with the majority of those sites located near the streams. In general, nitrate concentrations from those spot samples are below 1 g/m$^3$.

751. Mr Fraser derived an output nitrate concentration in groundwater of 1.5 g/m$^3$ for existing conditions in the Hook catchment, slightly below the concentration observed in the available wells with mean nitrate concentration being 2 to 2.5 g/m$^3$.

**Hook catchment – Wainono Lagoon**

752. The Hook River, Waituna Stream and a number of smaller unnamed watercourses drain into the Wainono Lagoon. Mr Fraser stated that in terms of their overall contribution to the Wainono Lagoon these smaller tributaries are considered to be intermittent in nature, only contributing flows during prolonged rainfall events or during times of elevated groundwater levels.
753. The Hook River is reported to gain in flow along its length, indicating that the river gains from groundwater. Mr Fraser expected as a result, an increase in the concentration of nitrate in groundwater was likely to result in an increase of nitrate in the Hook River.

754. Mr Fraser reported that long term groundwater quality sites for wells shallower than 20 metres within the lowland area of the Wainono inflows and Hook River valley indicate varying patterns in nitrate concentrations. He noted that nitrate concentrations in groundwater in the Hook River catchment show considerable variance with some suggestion of influence of point source resulting in one very high (18 g/m³) nitrate concentration reading. More typical reported nitrate concentration values range between 1 and 3.2 g/m³ with maximum values reaching 7.8 g/m³ at one location.

755. Mr Fraser reported that, overall, the long term records show maximum nitrate concentrations in the Hook River to be below 2 g/m³, with average nitrate concentrations generally being between 0.2 and 0.6 g/m³.

756. Water samples taken from the Waituna Stream adjacent to SH 1 between 1997 and 1998 indicate a maximum nitrate concentration of 1.2 g/m³ and a mean concentration of 0.27 g/m³. Further south, samples show similar concentrations, with a maximum and mean nitrate concentration of 1.7 g/m³ and 0.49 g/m³ respectively.

757. Highest concentrations of total phosphorus are observed in the site located upstream where the Hook River is surrounded by the downlands. A second monitoring site is located at SH1, and shows lower concentrations. Mr Fraser considered this was likely due to the gaining nature of the river, which is fed by groundwater and smaller tributaries and hence phosphorus inputs are diluted. At the SH1 the average total phosphorus concentration is 0.025 g/m³, which Mr Fraser said is an order of magnitude less than the average total phosphorus concentration for the Wainono Lagoon.

758. Nitrate concentrations within the Dead Arm of the Wainono Lagoon were being recorded monthly at Poingdestres Road between 1996 and 1998. Over that time concentrations of nitrate did not exceed 1.6 g/m³, with a mean concentration of 0.5 g/m³.

759. Wainono Lagoon receives water from the Hook catchment. The lagoon has been significantly modified since human settlement. The area and depth of the
lagoon has been reduced by drainage, and input of sediment and nutrients from the catchment has contributed to deterioration in water quality. The lagoon is currently classified as supertrophic which is the second most degraded trophic state (exceeded only by the hypertrophic level) in a New Zealand lake trophic level classification system. The lagoon was probably once in an oligotrophic or mesotrophic state (two levels below supertrophic in the classification). In general terms, this means the lagoon water contains high levels of nutrients.

760. The water quality of Wainono Lagoon has been sampled on its western margin since 2000. The record of nitrate concentrations in the lagoon indicates periodic flushing, with peak concentrations above 0.8 g/m³ being reduced to concentrations below 0.2 g/m³ on a regular basis.

761. The maximum total phosphorus concentration recorded in the Lagoon is 1.7 g/m³, with a mean concentration of 0.27 g/m³. Mr Fraser stated that phosphorus concentrations in Wainono Lagoon are higher than typically observed in New Zealand lakes which are less than 0.1 g/m³ total phosphorus. The maximum bioavailable phosphorus concentration in the Lagoon was 0.34 g/m³, with a mean concentration of 0.05 g/m³.

762. Groundwater quality information in the Waihao Downs Area is sparse. Mr Fraser said that the only site with multiple water quality samples was located near Crystal Brook. The mean NO₃-N concentration at this site is 2.7 g/m³. However two samples returned NO₃-N concentrations of 7.5 g/m³ and 8 g/m³.

763. Mr Fraser said that no mass balance modelling of the Waihao Downs catchment had been undertaken, due to its geological heterogeneity and the absence of representative long-term groundwater and surface water quality on which to base the assessment.

764. Increased stocking rates associated with irrigated pasture also had the potential to cause microbial contamination of surface water and groundwater resources. Mr Fraser said that the potential for microbial contamination was influenced by the irrigation method, soil and aquifer characteristics as well as the presence of on farm management practices such as riparian buffers.

765. Due to the relatively heavy nature and reasonable thickness of the soils across the downlands and the coastal areas, Mr Fraser expects that microbial contamination derived from the downlands is unlikely to have an adverse effect on groundwater quality of the alluvial valleys and will be localised to contaminant
sources, such as down gradient of dairy shed effluent disposal fields. Only low counts of bacteria are likely to leach through the soils and unsaturated zone under spray irrigation methods and where microbial contamination of groundwater does occur, he expected it to reduce to below drinking water guidelines in a relatively short distance. He said the siting of dairy shed effluent disposal fields will require planning to provide for an adequate buffer distance between the disposal area and any down gradient potable water supply.

766. Significant faecal contamination arose through the deposition of faeces by grazing animals directly into waterways in New Zealand. Microbial water quality improvements had been realised by fencing stock from ephemeral streams, wetlands, seeps, and riparian planting adjacent to paddocks that are prone to saturation.

767. Surface water quality sampling had been undertaken more frequently than the groundwater sampling within the Waihao Downs. Generally, water quality in terms of nitrate and nitrite concentrations was very good, with very low concentrations of this nutrient. Also he said that dissolved Reactive Phosphorus (DRP) within the Waihao catchment is generally at or below the limits of detection.

768. Mr Fraser considered that based on the information available for the Elephant Hill catchment that groundwater and surface water is of a high standard in terms of nitrate concentrations.

Conclusion

769. The groundwater within the HDI command area is generally of reasonable quality with respect to nutrient concentrations, and poses a low level of risk to human health through its consumption. Surface water quality is more variable and reflects the dominance of agriculture in local catchments. Nutrient concentrations are generally elevated. Of greatest concern is the water quality of Wainono Lagoon, which is characterised by high to very high nutrient levels.

770. Predicted water quality under HDI and the relationship between predicted water quality and the proposed Natural Resources Regional Plan
The role of OVERSEER®

771. Dr Ryan and Mr Fraser both used OVERSEER® to predict water quality changes under HDI. OVERSEER® is a software modelling tool used to examine the impact of nutrient use and flows within a farm on nutrient use efficiency and possible environmental impacts. Dr Ryan relied on OVERSEER® simulations to provide an estimate of the likely soil nitrate leaching load from the land use scenarios investigated, because OVERSEER® had been developed by AgResearch, MAF and Fert Research to a point where it was generally regarded as the most accurate and reliable tool available for modelling soil nutrient dynamics in New Zealand’s agro-ecosystems.

772. The primary input variables in the OVERSEER® model that influence results are:

- Stock type and stocking rate;
- Inorganic fertiliser inputs (esp. nitrogen); and
- Hydraulic inputs (rainfall and irrigation).

773. Dr Ryan made a number of assumptions for all the simulated scenarios, he adopted:

i. A mean annual rainfall of 521 mm per year which represents the dryer coastal areas of the HDI scheme area. However he also assessed the impact of higher rainfall areas within the HDI command area.

ii. Irrigation inputs of between 317 and 571 mm per year, with the lower input used for irrigated arable land use on deep soils and the higher irrigation amount for irrigated pastoral land uses on soils with lower PAW (Plant Available Water) and applied with a Roto-rainer.

iii. A soil type of recent yellow grey earth/brown grey earth.

iv. Soil drainage estimates derived from a soil water budget for the district using climate data for Timaru and Waimate.

v. Stocking rates for sheep and beef pastoral farms essentially based on the projected pasture production and corresponding stock carrying capacity of land within the scheme area.
774. Dr Ryan believed that the production and management assumptions, he made, presented a realistic representation of the current dry land farming systems and the possible future farming scenarios in the HDI scheme area under irrigation.

775. Dr Ryan also assessed the influence of increasing nitrogen fertiliser usage on the likely nitrate nitrogen concentration in soil drainage, specifically with respect to how they compared with a number of threshold drainage concentration values highlighted under Rule WQL18 of the PNNRP.

776. Mr Fraser, in his modelling of concentrations in ground and surface water also using OVERSEER, also tested his modelling results of the current land use against recorded water quality records and, where there were significant differences, scaled his modelled scenarios to the measured ratio.

777. Mr Fraser then described four catchment studies that were undertaken to assess the potential effects of the intensification of land use as a result of irrigation. The current drainage characteristics and potential adverse effects on water quality within those four catchments was representative of the majority of the scheme area. The catchments where mass mixing modelling of NO₃-N concentrations have been undertaken include the Pareora River, Otaio River, Makikihi River and Wainono Lagoon and Hook Catchments.

778. The expected land use mix for each of the catchments under current conditions and following implementation of the HDI scheme were provided by the Agribusiness Group. Most of the change was expected to be from general dry land pastoral farming to dairy farming with minor changes in arable farming.

779. Mr Fraser presented a summary of the potential effects on surface water and groundwater quality within the Scheme’s command area associated with the introduction of irrigation as follows:

**Pareora Catchment**

780. NO₃-N concentration in groundwater of 4.9 g/m³ for the existing land use. Incorporation of the expected HDI scheme land use distribution, drainage input volumes and concentrations gave a NO₃-N concentration in groundwater of 8.6 g/m³ at the down gradient end of the catchment. Implementation of the Best
Management Practices (BMPs) resulted in a potential reduction of the predicted nitrate concentration to 7.2 g/m³.

Otaio Catchment

781. An output nitrate concentration in groundwater of 2.3 g/m³ was derived for the existing land use. This appeared to slightly overestimate the existing conditions which indicates typical groundwater quality at around 0.5 to 1.0 g/m³.

782. Incorporation of the expected HDI scheme land use distribution, drainage input volumes and concentrations gave a NO₃-N concentration in groundwater of 4.3 g/m³ at the down gradient end of the catchment. Mr Fraser predicted the implementation of the BMPs could result in a reduction of the predicted nitrate concentration to 3.6 g/m³.

Makikihi Catchment

783. An output NO₃-N concentration in groundwater of 2.1 g/m³ was derived for the existing land use. Incorporation of the expected HDI scheme land use distribution, drainage input volumes and concentrations gave a NO₃-N concentration in groundwater of 5.4 g/m³ at the down gradient end of the catchment. Implementation of the BMPs resulted in a potential reduction of the predicted NO₃-N concentration to 4.3 g/m³.

Wainono Lagoon Catchment

784. The obtained output NO₃-N concentration in groundwater of 3.4 g/m³ was derived for the existing land use. This compared closely to measured concentrations of nitrate within groundwater in the lower end of the catchment reported as between 2.5 and 3.5 g/m³. Incorporation of the expected HDI scheme land use distribution, drainage input volumes and concentrations gave a NO₃-N concentration in groundwater of 7.3 g/m³ at the down gradient end of the catchment. Use of BMPs resulted in a potential reduction of the predicted NO₃-N concentration to 5.9 g/m³.

Hook River Catchment

785. An output nitrate concentration in groundwater of 1.5 g/m³ for existing conditions. Slightly below the concentration observed in the available wells with
mean NO₃-N being 2 to 2.5 g/m³. Incorporation of the expected HDI scheme land use distribution, drainage input volumes and concentrations gave a NO₃-N concentration in groundwater of 4.2 g/m³ at the downgradient end of the catchment. Use of BMPs could result in a reduction of the predicted nitrate concentration to 3.4 g/m³.

**Hook River Surface Water Balance**

786. Mr Fraser's water balance for the Hook River using existing land use predicted NO₃-N concentration in the Hook River estimated to be 1.7 g/m³, which is twice the mean observed concentration of 0.9 g/m³. Post the HDI scheme land use changes the water balance predicted concentration of NO₃-N in the Hook River would rise from 1.7 g/m³ to 4.7 g/m³. If he assumed the level of overestimation is similar to the current water balance the NO₃-N concentration in the Hook River may potentially increase from 0.9 g/m³ to 2.5 g/m³.

**Wainono Lagoon Surface Water Quality**

787. While the magnitude of the components of the water balance for the Wainono Lagoon are subject to uncertainty, it is apparent that a significant portion of the water in the lagoon is from the Hook River while groundwater, spring fed streams discharge and rainfall are smaller contributors to the lagoon. Based on the modelled concentration of NO₃-N within the water sources, Mr Fraser assessed the potential post HDI scheme water quality within the lagoon using the same mass balance approach utilised for the Hook River.

788. Based on the expected inputs to the Wainono Lagoon, the existing NO₃-N concentration within the lagoon was predicted by Mr Fraser to be 1.1 g/m³

789. Accounting for the overestimation of the NO₃-N concentration produced by the mass mixing model, whereby the average observed concentration in the lagoon (0.2 g/m³) was 0.9 g/m³ less than the modelled concentration (1.1 g/m³), the average NO₃-N concentration in the lagoon could potentially increase from 0.2 g/m³ to 0.5 g/m³ (based on a Hook River concentration of 2.5 g/m³ NO₃-N).

**Waihao Downs Catchment**

790. No mass balance modelling of the Waihao Downs catchment has been undertaken, due to its geological heterogeneity and the absence of representative long-term groundwater and surface water quality on which to base the assessment.
Microbial Contaminants

791. Increased stocking rates associated with irrigated pasture also has the potential to cause microbial contamination of surface water and groundwater resources. Mr Fraser said that the potential for microbial contamination is influenced by the irrigation method, soil and aquifer characteristics as well as the presence of on farm management practices such as riparian buffers.

792. He said the location of dairy shed effluent disposal fields will require planning to provide for an adequate buffer distance between the disposal area and any down gradient potable water supply.

793. Significant faecal contamination arose through the deposition of faeces by grazing animals directly into waterways in New Zealand. Microbial water quality improvements had been realised by fencing stock from ephemeral streams, wetlands, seeps, and riparian planting adjacent to paddocks that are prone to saturation.

794. Mr Fraser also made a comparison of the existing environment and expected effects having regard to the relevant objectives and policies of the proposed NRRP. Mr Norton also made comment on surface water quality effects under HDI as they relate to the proposed NRRP.

Groundwater

795. Chapter 4, Objective WQL2 of the proposed NRRP provides for water quality outcomes for groundwater and contaminated land. In terms of nitrate, Objective WQL2 seeks to limit the potential impacts of human activity on groundwater quality by stating that the maximum concentration shall not increase by more than 2 g/m³ above the maximum concentration measured between 1996 and 2001, and reported in 2002 (Hanson, C., 2002), and the maximum concentration shall not exceed 11.3 g/m³.

796. Under the proposed NRRP, specific zones (nitrate zone (NN) and inland zone (IB)) have been highlighted (Page 4 - 210) on planning maps where groundwater (in unconfined or semi-confined aquifers) is potentially at risk from the passive discharge of nitrate-nitrogen from land use activities. Use of land located in these zones are regulated under Rule WQL18 of the proposed NRRP. As all of the HDI scheme command area is located within the NN zone, most land use activities in the HDI scheme would be regulated under that Rule.
797. Rule WQL.18 states that the use of land that may result in the discharge of nitrate-nitrogen into groundwater in an unconfined or semi-confined aquifer is a permitted activity provided compliance with all conditions of the rule, otherwise the activity is classified as a discretionary activity and resource consent is required. The rule regulates farm activities essentially by using a threshold approach where if the average annual nitrate-nitrogen concentration in soil drainage (below the plant root zone) from a property exceeds a number of threshold values then action is required.

798. The first threshold uses a nitrate-nitrogen drainage concentration of 8 g/m³. For any land use activity where the nitrate concentration in soil drainage is likely to exceed this value (8 g/m³), the annual average nitrate concentration in soil drainage for the property must be calculated (using an approved method) on an annual basis and best management practices must be implemented to reduce the loss of nitrate-nitrogen to soil drainage water. If the calculated average annual nitrate-nitrogen concentration in soil drainage is calculated to exceed 16 g/m³ (second threshold) then active steps must be taken to reduce (at a rate of at least 5 percent per annum) the average annual nitrate concentration in soil drainage below this value.

799. Rule WQL.18, acknowledges that for the majority of pastoral land use situations, the average annual nitrate concentration in soil drainage will not exceed 16 g/m³. Rule WQL.18 also states that arable systems that use winter cover crops in at least one year in six will not exceed the 16 g/m³ threshold for nitrate concentration in drainage.

800. The modelling exercise undertaken by Dr Ryan for the various land use farming situations are in general agreement with what is noted in Rule WQL.18 of the proposed NRRP, that most typical (using moderate nitrogen fertiliser inputs) farm land use scenarios (dry land or irrigated) will not exceed the 16 g/m³ nitrate drainage concentration threshold. The exception to this was the conventional irrigated arable farm scenario.

801. The mass mixing modelling undertaken as part of the assessment of effects for HDI shows that in most cases that the modelled increase in nitrate in the catchments exceeds the 2 g/m³ limit.
802. The mass mixing modelling indicated that the concentration of nitrogen nitrate is not expected to exceed the MAV provided by the Drinking Water Standards of New Zealand (DWSNZ).

803. The concentrations of nitrate-nitrogen reported in 2002 for the HDI catchments show a varying level of nitrate in groundwater, with the amount of data provided in the report considered to be sparse. None of the catchments that were modelled indicated that the potential change of land use following the implementation of HDI would result in nitrogen nitrate levels in groundwater exceeding 11.3 g/m³.

804. Given the scarcity of data that is provided in the 2002 report Mr Fraser considered that the second trigger level (i.e. a concentration of 11.3 g/m³) was more appropriate to measure the effects of land use intensification against.

805. Because of the geology of the area Mr Fraser expected that microbial contamination derived from the down lands was unlikely to have an adverse effect on groundwater quality of the alluvial valleys and would be localised to contaminant sources, such as down-gradient of dairy shed effluent disposal fields.

**Surface water**

806. Mr Norton noted that an increase in nutrients to water is a clear potential effect under HDI. The URS study (described in the evidence of Mr Fraser) predicted an approximate doubling of dissolved inorganic nitrogen (DIN) and dissolved reactive phosphorus (DRP) concentrations in surface waterways, if the HDI scheme went ahead unmitigated. When the effects of some mitigation measures such as nitrification inhibitors were taken into account, this resulted in some reduction to the predicted DIN, but the predicted increase in DRP remained the same.

807. Objective WQL2 of the proposed NRRP states that the median concentration of faecal bacteria indicator *E. coli* shall be less than one organism per 100 millilitres of water. *E. coli* is prevalent in areas immediately down-gradient of septic tank discharges and is commonly found in areas associated with the discharge of dairy shed effluent and stock run-off.

808. Mr Norton described potential mitigation measures, including best farm management practices, and off-farm mitigation and enhancement. These
included development of wetlands along intermittent streams draining the downland country to help absorb nutrients before drainage water reaches the alluvial valleys and higher order streams, and enhancing riparian vegetation along river margins to off-set increased nutrient loads. He suggested there were opportunities to enhance the environment of Wainono Lagoon for a variety of values held by the local community and stakeholders, for example the enhancement of native vegetation around the margins of the lagoon.

809. In terms of the effectiveness of these suggested mitigation measures, Mr Norton noted that these would vary widely with quality of design and care in implementation, and will also be strongly influenced by nutrient loading rates, local conditions such as soils, climate, time-scale, and topography. For this reason he could not quantify the total benefit of mitigation for the HDI scheme in terms of off-setting the predicted increases to nutrient loads.

810. However he stated that by way of guidance, BMPs were unlikely to totally offset the increases in nutrient loads due to HDI land use, but could reduce these increases significantly, noting that the dairy industry goal of 50% reduction of nutrient loads may be realistic for the HDI scheme area, especially if nitrification inhibitors are effective in reducing nitrogen losses from HDI soils and if farmers restrict fertiliser phosphorus application to the agronomic optimum amounts. He said that reduced faecal contamination of waterways can be expected with the HDI proposal to exclude large stock (i.e., cattle, deer, pigs) from 100% of flowing waterways in the scheme area and with full implementation of the Clean Streams Accord requirement of at least 90% fencing of waterways from stock access by 2012 outside the scheme area.

811. Mr Norton noted that the proposed NRRP Objective WQL1 and water quality standards of Schedule WQL1 were relevant for Wainono Lagoon and the rivers that may be affected by the HDI scheme. The standard for indicator micro-organisms is not currently achieved for a large proportion of the time in Wainono Lagoon and lowland streams, and for a small proportion of time in hill-fed streams. Intensification would increase the time spent in breach if not mitigated.

812. Similarly the nutrient standards are not currently achieved for a large proportion of the time in Wainono Lagoon and lowland streams, and for a small proportion of time in hill-fed streams. Intensification would significantly increase nutrient concentrations and therefore the time spent in breach if not mitigated.
813. Mr Norton recommended an array of monitoring programmes, noting that Ms Dawson in her planning evidence had proposed a monitoring condition that requires preparation of a Monitoring Plan for the scheme. He recommended that this Monitoring Plan include surface water quality at representative sites on each of the hill-fed river catchments, selected lowland streams and in Wainono Lagoon. Monitoring parameters should include the physical, chemical, microbiological and plant biomass parameters necessary for assessing the state of compliance with numeric outcomes of the proposed NRRP. Results from this monitoring would be used for state and trend analysis regarding outcomes of the proposed NRRP, and would progressively inform HDI managers and the Regional Council on the success or otherwise of mitigation measures.

814. He supported some form of automated surveillance monitoring of the opening behaviour of the Waihao Box, because the frequency and timing of openings could affect the interpretation of Lagoon water quality monitoring, and is also critical for native fish that require passage to and from the sea to complete their life cycle.

Possible Mitigation Options

815. Dr Ryan examined two practical nitrate leaching mitigation options that have been proposed that could be readily employed through the HDI scheme management plan:

i. The use of biochemical nitrification inhibitors (NIs) on grazed pastoral farms; and

ii. The use of winter cover crops on arable farms.

816. Dr Ryan said that nitrification inhibitors act by slowing the first stage of nitrification (i.e. the conversion of ammonium nitrogen to nitrite) by inhibiting soil nitrifying bacteria and reducing the rate at which ammonium nitrogen is converted to nitrate nitrogen in the soil. He said that by reducing the rate of conversion from ammonium to nitrate, NIs help reduce nitrate leaching losses and enable more mineral nitrogen to be retained within the soil plant root zone for plant use.

817. Mr Carl Hanson, in the section 42A report, was more cautious about the use of nitrogen inhibitors and the considerable weight put on the effectiveness of
nitrification inhibitors, which represent a fairly new technology. He said that he was not certain that trial results can be translated to the scale of the HDI scheme.

818. In response, Dr Ryan noted that nitrification inhibitors are a new technology, however their effectiveness in reducing nitrate leaching from grazed pastoral systems in New Zealand has been well researched with eleven peer reviewed international journal papers being published within the last five years. Hence, nitrification inhibitors have now been established as a viable and effective mitigation tool, and are widely accepted as such by the agricultural science community within New Zealand.

819. Dr Ryan also pointed out that two studies undertaken in Canterbury have reported annual reductions in nitrate leaching of 59% and 74 - 76% in irrigated grazed pastures treated with NIs. These studies were undertaken on free-draining (i.e. stony silt to deep sandy) soils which are typical of Canterbury conditions.

820. He also said that nitrification inhibitors are effective on heavier soils. A two year study undertaken by AgResearch Limited on a Southland dairy farm with heavy silty soils (which are comparable to the heavy silty soils in the HDI scheme command area), reported an annual reduction of nitrate leaching from pasture treated with NIs of 42%.

821. Given the research undertaken in New Zealand so far, Dr Ryan believed that there is enough evidence to indicate that NIs can be an effective tool in mitigating nitrate leaching losses from grazed pastures in New Zealand. The literature also tends to indicate that NIs are also effective in heavier soils as well as lighter free-draining soils, albeit, the effect may not be as significant.

822. Currently OVERSEER® cannot account, although future versions (after December 2008) of the model will, for the use of NIs in grazed pastoral systems; as a result Dr Ryan had to make an estimate of the likely effect of using NIs as a mitigation option. He therefore conservatively estimated, (in his opinion) that the use of NIs on grazed pastures grown on the heavy silt soils that tend to dominate the HDI command area, will deliver a 30% reduction in nitrate leaching losses.

823. In Dr Ryan's view cover crops are also another useful mitigation tool, where they can be used to reduce or eliminate the traditional fallow periods between crops over the winter period to mitigate nitrate leaching losses from arable systems. Mr Hanson (section 42A officer) said that the variability of the results of
cover crops made reliance on their effectiveness questionable. Dr Ryan agreed that results were variable, but said that research has shown that the use of winter cover crops can be highly effective in reducing winter leaching losses compared to bare fallow ground.

824. The cropping module of OVERSEER® can also incorporate cover crops in normal cropping rotations, and Dr Ryan therefore adopted the model's predictions for the use of cover crops as a mitigation measure against nitrate leaching from irrigated arable systems in the HDI scheme. From the results Dr Ryan was confident the use of NIs on irrigated grazed pastoral land and the use of winter cover crops on irrigated arable land will on average reduce N leaching from these systems and the corresponding mean nitrate concentration in drainage waters below the 16 g/m³ threshold.

825. It was Dr Ryan's opinion that if the NI mitigation measure is used in conjunction with moderate nitrogen fertiliser usage (200 kg N ha/y), all irrigated pastoral farms within the HDI scheme area are likely to comply with the nitrate drainage concentration threshold of 16 g/m³ specified under Condition 3 in Rule WQI.18.

826. A number of submitters voiced their concerns about water quality in the HDI command area.

827. Mr Roger Small, a member of the Waihao-Wainono Water Users Society, expressed concern that HDI would make the Society's goal of maintaining or improving water quality very difficult to achieve. He requested detailed ground and surface water quality monitoring as well as monitoring of fish communities. If monitoring revealed that adverse water quality effects were occurring he asked that these should be addressed immediately otherwise the scheme should be shut down until the points of contamination are isolated and fixed.

828. Mr Small endorsed the used of farm management plans but considered those submitted by the applicant were too general in nature. He said, these plans should be made compulsory, be able to be monitored and be enforceable and auditable.

829. Dr Coffey on behalf of Te Runanga o Ngai Tahu reviewed Mr Norton's evidence and did not present any alternative opinion on likely effects of HDI on water quality in the command area. He agreed with Mr Norton that best management practices have the potential to reduce but not prevent nutrient
concentration increases in local streams and Wainono Lagoon.

830.  Mr Deans also provided evidence on water quality in the HDI command area, in particular Wainono Lagoon, on behalf of Central South Island Fish & Game Council. Indeed all submitters and witnesses, including the Section 42A reporter (Dr Greg Burrell), agreed that water quality would probably worsen under HDI even with proposed mitigation.

Conclusion

831.  Ms Dawson for HDI presented a detailed summary of water quality in the receiving catchment and how it relates to the objectives and policies of the Allocation Plan and the proposed NRRP. She pointed out that the Allocation Plan does not fully address matters of water quality in relation to the use of the water, and defers to Chapter 4 of the proposed NRRP for consideration of this. At the time of the hearing, there was still a considerable way to go through the statutory processes before the final form of the NRRP is known, and that situation remains.

832.  Ms Dawson considered it was too early to tell what the final objectives and outcomes of the NRRP might be, and whether they are consistent with the rules specified in that Plan, particularly in relation to water takes and use, and land use activities that result in non-point source discharges.

833.  Objective WQL1 of the NRRP seeks water quality in rivers and coastal lagoons to be maintained or improved. It is clear to us from the evidence provided by all parties that this objective is unlikely to be fully met under HDI for streams and lagoons in the command area.

834.  There was an element of uncertainty regarding whether water quality under HDI in the command area would meet the objectives of the NRRP as they are currently worded. Mr Norton was of the view that Wainono Lagoon was already in a very degraded state (a view shared by many submitters) and some further degradation would not alter the lagoon's ecological condition or its value as a source of mahika kai, a position supported by Dr Jellyman.

835.  Mr Norton did not provide an opinion on whether the predicted changes in water quality from HDI would be less than minor, a point also made by Dr Coffey in his evidence. It is clear to us from the evidence provided by all
parties that some aspects of water quality will worsen under HDI and it is a
matter of weighing these adverse effects against potential positive effects
of the proposal.

836. Similarly, Ms Dawson in her planning assessment of water quality
effects does not really venture an opinion on whether the anticipated
effects of HDI on water quality are consistent with objectives and policies
of planning documents. Rather she states:

“Overall, I conclude from the above, that the outcomes contained in the water
quality objectives of the PNRRP would be achieved as much as would be
possible with any irrigation scheme in the HDI area. Whilst there will inevitably
be increases in nutrient levels in ground and surface water, these would not
exceed drinking water standards for groundwater, and would not measurably
increase the risk of toxic algal blooms or harmful water quality conditions in
Wainono Lagoon. In unshaded parts of some rivers within the Scheme Area,
the periods of time that nuisance growths occur, or conditions are limited for
invertebrates and fish, are likely to increase over that which currently occurs.
Increased flows in the streams and water levels in the summer in Wainono
Lagoon also have beneficial effects for habitat for indigenous species and
aesthetic values. Exclusion of heavy stock from waterways, nutrient budgets,
efficient fertiliser and water use, and the potential for riparian planting (for
shading and habitat) and wetland enhancement, are best practice measures
that would be either required, or encouraged, through the conditions proposed
for the Scheme and Farm Management Plan requirements of HDI. Given the
early stage of the PNRRP, the degree to which its specific provisions are
contested, and the inconsistencies and lack of clarity I have discussed, I am
satisfied that the HDI proposal, with its proposed mitigation measures, will
work to achieve the direction of the water quality objectives as much as is
possible for such an activity.”.

837. This statement seems to us to encapsulate the reality of the situation. It
highlights the significant reliance on Scheme and Farm Management Plans
being wholly adopted, implemented and adhered to throughout the HDI
scheme area in order to reduce the degree of potential adverse effects on
water quality and surface water ecology.

838. Dr Burrell (a section 42A reporting officer) was of the opinion that the
proposed monitoring and mitigation is ‘tenable’, if the management plans
are able to form an enforceable component of the consent. However, he considered that the management plans that he had seen required greater detail concerning monitoring and management actions, and clarity on how these will be monitored and enforced by the consent authority. Until that was done, he could not comment further as to whether or not the HDI will result in significant adverse effects in the irrigation area.

839. There is benefit to be gained with HDI in identifying and protecting mudfish habitat and providing general protection and improvement to the margins of waterways in the command area. Again, these benefits will be reliant on the implementation of management plans.

840. Referring back to Dr Burrell’s concerns we record that at the resumed hearing on 2 and 3 March 2010 we received a revised version of the conditions proposed by the applicants and these are considerably “tighter” than some earlier versions. We note too that proposed Condition 14 which requires the consent holder to prepare a Scheme Management Plan includes a provision (Condition 14n) which requires the consent holder to establish, collect and operate a Scheme Environmental Management Fund. This fund is to be used by the consent holder to fund environmental mitigation required as a result of the effects of the operation of the Irrigation scheme, which is not otherwise required by the individual Farm Management Plans or specific in consent conditions, and other environmental management projects within the area affected by the operation of the Scheme. We see merit in this approach.

841. In our evaluation we will address this matter further in the context of the requirements of the RMA and in particular the relevant matters in Part 2 of that Act.

Aquatic Ecology

Periphyton and phytoplankton

842. Mr Norton and several other witnesses for HDI described the existing ecological character of local streams and Wainono Lagoon. Mr Norton noted that modelling of nutrient concentrations in ground and surface waters was used to assess effects of HDI on periphyton growth in rivers and phytoplankton growth in Wainono Lagoon.
Mr Norton noted that most of the rivers in the HDI scheme area are stony-bottomed, hill-fed rivers (e.g., Waihao, Waimate, Hook, Makikihi, Kohika, Otaio and Pareora) with perennial flows in their upper reaches but, on reaching the permeable Canterbury Plains, have reducing and varying intermittently flow in the mid to lower reaches. In many cases flow is then gained from groundwater in the lower reaches closer to the sea. These hill-fed streams are subject to periodic flooding from rainfall in the headwaters. Some of the HDI area streams are lowland or spring-fed, with stable flows and low flood disturbance (e.g., Merry Stream, Buchanans Creek, Sir Charles Creek, Waituna Creek).

Wainono Lagoon is a Department of Conservation area. It is a large, shallow coastal lagoon, impounded behind a low shingle beach bar. The water is brackish, usually less than 1m deep, and provides important habitat for waterfowl, migratory birds, coastal birds and native fish, including whitebait spawning. The lagoon is a wetland of international importance under the Ramsar Wetland Convention. It is a regionally significant natural feature and landscape; it is a mahi kai area for Te Runanga o Waihao, supports eel and brown trout fisheries, and is popular for game bird shooting and bird-watching.

Mr Norton described how water quality modelling predicted significant increases in periphyton biomass that would increase the frequency and extent of breaching the outcomes of proposed NRRP Objective WQL1.1 (Table WQL5) for nuisance growths in hill-sourced and lowland streams. This effect would have consequences for aesthetic and recreation values, and aquatic ecology values. Effects on benthic invertebrate populations and fish spawning were possible as were undesirable changes in dissolved oxygen and water pH.

Large additions of nitrogen to Wainono Lagoon could result in increases in phytoplankton biomass. If nitrogen concentrations were approximately doubled under the unmitigated HDI scheme, Mr Norton estimated a worst-case increase in phytoplankton biomass of approximately 50% over current levels. This would shift Wainono Lagoon from its current lower end of the supertrophic level of the classification to the mid-upper end of the supertrophic level.

Mr Norton concluded that such a change in trophic state could result in a number of aesthetic and ecological consequences. These included a greening of the water, increased phytoplankton concentrations, less likelihood of macrophytes dominating, a slight increase in periodic low dissolved oxygen
levels and possible changes to invertebrate and fish communities that would be
difficult to predict with accuracy.

Effects of didymo transmission via the irrigation system

848. The issue of the transportation and distribution of didymo cells from the
Lower Waltaki River throughout the HDI scheme area was also addressed by Mr
Norton. Didymo cells could potentially enter surface waterways either via surface
run-off from pasture or via by wash drains.

849. Mr Norton noted that didymo is already present in the Waihao River and was
of the view that it is likely that it will spread to other surface waterways in the
scheme area either via human, stock or waterfowl movement. If didymo has not
already spread throughout the scheme area by the end of the proposed HDI
construction schedule (2012-2015), he considered that it would eventually spread
throughout the scheme area via HDI irrigation water during heavy rainfall or
emergency by wash discharges.

Conclusion

850. We conclude that there is a possibility that periphyton growth in rivers
and phytoplankton biomass in Wainono Lagoon will occur under HDI, even
with proposed mitigation. The level at which these might occur is difficult
to predict given uncertainty over the degree of effectiveness of proposed
mitigation options and other environmental variables that can influence
these biological growths. We accept the evidence of the applicant that such
water quality changes may in themselves not result in adverse effects on
local invertebrate and fish communities given their existing exposure to
similar conditions.

851. We accept that if granted HDI would probably result in the transfer of
didymo cells to catchments within the HDI command area. We have heard
that it is already present in some catchments and, given its rapid spread to
catchments throughout the South Island, we consider it is almost inevitable
that it will eventually reach these catchments, with or without HDI. As to
what effect didymo may have on the ecology and recreational attributes of
waterways within these catchments, is less certain.

852. The applicant has offered no mitigation in relation to this potential
effect. Mr Norton considers it likely that didymo will be spread throughout
the Scheme Area by the time HDI has been constructed. He notes that by 2012 the effects of didymo on New Zealand aquatic ecosystems will be better understood and chemical controls may be an option for small streams. This somewhat speculative comment is all we have to go on.

Sport fish

853. Mark Webb described the sport fish values that currently exist within the lowland South Canterbury rivers within the HDI command area, in particular the Pareora, Otalo and Waihoa rivers. It appears that these rivers have suffered somewhat over time through a combination of reduced flows in summer, habitat modification and water quality degradation.

854. Mr Webb questioned the evidence of Mr Fraser regarding improved flows in streams within the command area and considered this assumption was unsubstantiated.

Native fish

855. Upland bully is the most frequently encountered species within the HDI scheme area, followed by Canterbury mudfish, common bullies, and longfin eels. Sites where mudfish have been recorded indicate that their distribution is widespread. The New Zealand Freshwater Fish Database contains 132 records of Canterbury mudfish, of which 32 are from the HDI scheme area, indicating that this area contains a significant proportion of the range of this endangered species.

856. The Wainono Lagoon and Waihao River are both designated as non-commercial eel fisheries in recognition of their high value to local iwi as sites of customary harvest. Whitebaiting on the Waihao River has been previously described as of ‘major recreational importance’ but of no commercial importance. The average number of whitebaiters has been assessed as 50-60, but that this could increase to 300 during long weekends and public holidays.

857. Dr Jellyman described the potential impact of HDI on native fish as being related to increased groundwater and surface flows, increased water levels in Wainono Lagoon, with the possibility of more frequent openings being required, and degraded water quality.
858. Dr Jellyman considered that increased groundwater levels are expected to result in slightly higher water levels in the Lagoon, but that this impact is not likely to be of ecological significance, because increased levels would be small, and high levels controlled by the periodic opening of the Waihao Box, in a similar manner to the present.

859. Because it is expected that the additional groundwater recharge will stop the lagoon getting as low as it currently does during some summer conditions, Dr Jellyman noted that this situation would be of benefit to fishery values by providing more extensive foraging areas for fish, and reduce any deleterious water quality effects. He recommended that to facilitate recruitment of juvenile fish (eels, whitebait, flounders, bullies), openings during spring (August -October) would be required, although most of this timing is outside the irrigation season (September-April). Similarly, the escapement of migratory eels occurs from March through May, again largely outside the irrigation season, meaning there is a low probability that any increased openings would benefit migrating eels.

860. Dr Jellyman anticipated that the likelihood of increased primary production having harmful effects on fishery values of Wainono Lagoon is low.

861. He recommended the provision of buffer strips and fencing of permanent wetland areas that could contain mudfish. In cases of uncertainty, he suggested that a survey could be carried out to find whether mudfish are present or not. Farmers not participating in the HDI scheme would also be encouraged to have such surveys carried out on their properties.

862. Dr Jellyman responded to comments in the section 42A officer's report relating to native fish (Dr Richard Allibone) and for adequate monitoring and mitigation of potential mudfish habitat. He noted that the applicant had proposed an assessment of the potential habitat for mudfish to be undertaken on those properties containing existing identified mudfish habitat. This assessment would provide recommendations for the protection of such mudfish habitats. If protection was not feasible, and he did not elaborate on what this meant, then an equivalent habitat would be created elsewhere. These recommendations would be incorporated into the Farm Management Plans being developed for individual users.

863. Further, partly in recognition that not all mudfish sites will have been identified, Dr Jellyman noted that the applicant proposed an additional strategy
that focuses on habitat protection through the use of buffer strips and fencing of waterways. He had recommended that this fencing also include permanent wetland areas, but in instances where the need for this is uncertain (whether mudfish are present or not), that a survey be carried out.

864. Mr Norton also supported recommendations by Dr Jellyman for pre- and post-commissioning native fish monitoring in Wainono Lagoon and key lowland streams, as well as potential mudfish habitat in the scheme area.

865. Dr Burrell considered there was uncertainty about the effects of increased stream flows on the security of nationally endangered Canterbury mudfish. He noted that flow intermittency currently protects (at least in part) this species from predation and competition with other fish species.

866. Dr Allibone (another section 42A reporter) considered that, prior to the commencement of HDI, there is a need for a survey programme to be carried out across the HDI area to confirm mudfish sites and survey for addition populations in wetlands and streams. He also noted that the New Zealand Mudfish Recovery plan already identified and listed key mudfish sites and these include four areas in the HDI area of South Canterbury or areas downstream of the scheme that are likely to be affected by changes to water quality and quantity. He also was of the view that some Canterbury mudfish populations that could potentially be affected by HDI activities are outside the HDI area, and as such the application of any management actions will depend on gaining the agreement of the landowners and the ability of the applicant to undertake management actions to mitigate impacts does not appear to be certain at this time.

887. Conclusion

888. As noted by a number of submitters and the section 42A reporting officers, the applicant has relied heavily on the Farm Management Plans to mitigate any effects on fish populations and fish habitat, and as yet the effectiveness of these is unknown. Dr Allibone considered the proposed methods to be appropriate in general terms, although the plans do not provide a mechanism to manage the effects on Canterbury mudfish populations outside of the HDI area that could be affected by water level and quality changes.

869. We see the Farm Management Plan as the most appropriate means of mitigating, and potentially enhancing, the effects of HDI irrigation on
habitat for fish, in particular the mudfish. The draft plans presented to us at the hearing included requirements to have exclusion mechanisms for heavy stock from rivers and wetlands adjoining land being irrigated, and identification of mudfish habitat and exclusion of heavy stock in areas containing mudfish. These requirements are to be invoked prior to first receiving irrigation water.

870. We see these plans being implemented on a wide scale basis in order for them to be effective.

871. Effects on Wainono Lagoon terrestrial flora and fauna communities

872. Ms Robertson described how Wainono Lagoon has a range of wetland vegetation along its margins including salt marsh communities (turflands), sedgelands and willow wetlands. Another vegetation community occurs on the gravel/stony beach barrier.

873. The immediate shores on the eastern side of the lagoon consist of large mudflats, with diverse native dominated salt marsh communities.

874. Wainono Lagoon is the largest coastal lagoon between Karitane and Lake Ellesmere (Waikora), and provides valuable feeding and roosting habitat for large numbers of coastal species. It is also an important 'staging site' before and after the breeding season, for migratory birds that breed inland. At least 90 bird species have been recorded at Wainono Lagoon. Threatened bird species that have been commonly recorded at the site include white heron, Australasian bittern, grey duck, banded dotterel, wrybill, black-billed gull, black-fronted tern, Caspian tern and white-fronted tern. Species recorded also include northern hemisphere migratory waders whose habitats elsewhere in the world are severely threatened. The lagoon is highly valued as a game bird hunting site because of the large numbers of waterfowl it supports.

875. Ms Robertson stated that it is difficult to predict the effects of increased water flows into the lagoon on the wetland ecosystems. The communities that are present are adapted to the currently wide ranging water levels and variable salinity, as well as the effects of wind and storm events and adjacent land management. The change in water inflows is predicted to have a relatively minor effect on actual lagoon water levels as the operation of the Waihao Box, combined with evaporation, tend to dominate and restrict the water levels. She noted it seemed likely that higher inflows may reduce the frequency and duration
of low water level events (particularly in summer) which would benefit the lagoon's ecology.

876. Ms Robertson did not expect the increased nitrogen and phosphorus levels in the lagoon to have a major effect on the plant species composition, given the high nutrient status of the lagoon already from the ground and surface water, and the likely high nutrient input from waterfowl.

877. She considered subtle changes in salinity could affect the relative location and species dominance in turfland communities, but provided the lagoon continues to be brackish, be influenced by salt spray, have fluctuating water levels and be grazed by waterfowl, then she expected the communities to continue to dominate on the extensive mudflats at the eastern end of the lagoon under the HDI proposal.

878. She did not expect the changes in water quantity and quality input to Wainono Lagoon from the HDI scheme would affect the vegetation community and associated ecosystem on the shingle beach barrier as they are above the lagoon water levels and more driven by ocean conditions.

879. Changes in salinity and nutrients have the potential to affect water birds by changing the community composition of the aquatic and mud-burrowing invertebrates on which some species of birds feed. However, Ms Robertson thought it unlikely that there would be any adverse effect given the prediction of no or very small changes in salinity and the range of food items that the water birds prey on.

880. She supported mitigation measures to minimise any potential adverse effects of increased nutrient inputs as well as any enhancement works to improve the values of the lagoon, such as native planting and protection from stock grazing.

881. Ms Robertson did not anticipate any adverse effects on the lowland streams' terrestrial values as a result of HDI, but supported recommended mitigation in the form of best management practices for farming, fencing of wetlands and waterways and native riparian planting to minimise any chance of effects and to provide some environmental enhancements.

882. Mr Webb for Central South Island Fish & Game Council noted that many of the game birds occupying wetlands and other habitat in South Canterbury are 'inextricably' linked to Wainono Lagoon and the Waitaki River. He gave an
example of 4,000 to 6,000 paradise shelduck moulting at Wainono Lagoon in February, which represented about half the entire region’s moulting population.

883. Mr Deans for Central South Island Fish & Game Council considered that the predicted effects of nutrient increases on Wainono Lagoon would be more than minor and may be significant, particularly for habitats of threatened species.

884. Dr Robert Jessop prepared a section 42A report that was reviewed and commented on by Dr Philip Grove. Dr Jessop commented in his review that there was no effects assessment on the terrestrial and wetland ecosystems for the HDI irrigation area in the AEE. He believed it was not possible for him to assess effects on the HDI command area, given the level of information provided by the applicant and recommended that some assessment was undertaken of the extent, sensitivity and risk that changes in surface and groundwater levels and quality may have on the irrigated areas within the HDI command area.

885. He said that the assertion that effects on ecosystems within the Wainono Lagoon are likely to be relatively minor, since ecosystems are relatively insensitive to habitat change due to the existing dynamic environment and habitat modifications, is valid but only within certain tolerance ranges.

886. Dr Jessop’s main concern was that the key assumption implicit in the assessment of effects of changing water levels and water quality was that the water level and water quality predictions were accurate. The risk he perceived was that the magnitude of effects for water quality and water quality changes could exceed those predicted and were not addressed.

887. Dr Jessop stated that the general HDI mitigation strategy for the effects of water level and water quality changes on terrestrial, riparian and wetland ecosystems focuses on capturing excess flows and nutrient contaminants at the source before they enter surface and ground waters. Mitigation proposed for adverse effects on terrestrial, wetland and riparian ecosystems were:

- Implementing farming best management practices (as proposed in the consent application), to reduce nutrient inputs and sedimentation of surface waters.

- Physical protection of riparian margins and wetlands (e.g. fencing).
• Wetland enhancement and wetland creation where appropriate.

• Riparian planting and weed control.

888. Mitigation proposed for adverse effects on coastal ecosystems down-gradient were stated as follows:

"The mitigation options identified for streams and wetlands would also reduce the effects of increased freshwater and nutrient inputs to Wainono and other coastal lagoons. However, it is likely that effects on coastal lagoons could not be completely avoided, and the ecology of these lagoons may change as a result. If the resultant changes were considered detrimental, there is scope for additional 'offset mitigation' by undertaking the actions identified for streams and rivers, above, around coastal lagoons."

889. Dr Jessop's report pointed out that mitigation is largely reliant on the effective implementation of farming best management practices as specified on a scheme-wide basis through the Scheme Management Plan (SMP) and then more specifically on a farm by farm basis through the individual Farm Management Plans (FMPs). Those plans form part of the suggested consent conditions presented in the AEE.

890. Dr Jessop's opinion was that the description of the environment was not detailed enough to adequately assess effects. Furthermore, there was a large degree of uncertainty inherent in the groundwater modelling that was not reflected in the assessment of ecological effects. Therefore, based on the information provided, he did not consider it was possible to assess the adequacy of the mitigation proposed. However, he did generally agree with the concept of adaptive management, provided the range of potential effects has been adequately scoped, so that the efficacy of management interventions (outlined below) can be evaluated. He stated that if further assessment revealed that adverse effects could be minimised via mitigation, then he considered the proposed adaptive approach to effects management was appropriate, provided the issues in the following sections could be resolved.

891. We note for the record here that Dr Jessop did not appear at the hearing and he had not commented on the evidence presented by HDI at that hearing.

Conclusion
We are uncertain whether any improvements to waterways (including Wainono Lagoon) and their associated terrestrial flora and fauna are anticipated in the absence of HDI. We received no evidence to suggest this was the case. Ms Robertson stated that she did not anticipate that there will be any adverse effects on the indigenous terrestrial habitat values of the lowland streams of the HDI scheme area, but supported best farm management practices as a means of minimising any chance of adverse effects and providing some environmental enhancements for habitat for indigenous species. She also considered that the changes in water quality and quantity with the HDI proposal would not cause significant adverse effects on the wetland vegetation, birds or fish of Wainono Lagoon, and went so far as to consider that increased water flow into the lagoon during summer would benefit the lagoon’s ecology. Other submitters in opposition were not so confident.

HDI does provide a pathway for developing an integrated management approach to land use activities and water bodies at a catchment-wide scale. If appropriately implemented through the consent process, management plans will provide a strong incentive for land owners to manage their activities with environmental outcomes in mind. To this end, we consider it essential that management plans include mechanisms that deter and control irrigators whose activities are adversely affecting the receiving environment.

The issue of effects of land use activities on land in these catchments not under HDI control has been raised by some witnesses. We are powerless to address this issue through this consent process, and would expect the Regional Council to take the lead on related catchment management issues, particularly where they may affect aquatic environments.

While we accept there are likely to be some effects on water quality associated with HDI we agree with HDI’s ecological experts that these effects are unlikely to change the general character of local water bodies provided scheme and farm management plans of the type outlined to us are implemented.
Farm Management Matters

896. Claire Mulcock is an environmental management consultant and has been a resource manager hydrologist since 1976. In this case, she gave evidence on a proposed environmental management system for HDI. She explained that this involved the development of a scheme management plan and a template for farm management plans.

897. Ms Mulcock provided a detailed discussion about the systemic approach to management of irrigation schemes, which we do not think it is necessary to go into here. The important point she made was that this process can be reflected in the conditions of resource consents for the taking and use of the irrigation water. She also said that the farm management plans are intended to be ongoing and adaptive. The process is well recognised in other industries but relatively new in agriculture.

898. Again, with regard to the farm management plans, she said there are a number of farm environment related codes of practice and guidelines that have been developed in New Zealand that take the classic approach of an environmental management system, that is to say, plan, do, check, act, review and revise, and she listed many of these which included a code of practice for nutrient management with emphasis on fertiliser use.

899. She also told us, and we learnt this from other witnesses, that the North Otago Irrigation Company (NOIC) has a form of mandatory environmental farm management plan for each user and an audit process is required by the consent conditions for that scheme. The element that is missing with NOIC is the linkage that a scheme environmental management plan provides. That gap is being remedied in this case.

900. The proposal for the HDI management system is an adaption of a system that has been developed by the RITSO Society, a farming and community group in Central Canterbury, but has been made specific to HDI. It involves, as we said earlier, the development of a scheme management plan, which contains policies, procedures, water user requirements and provisions for compliance. This leads in turn to water user agreements between HDI and the specific farm users, which Ms Mulcock characterised as being a legal contract between those parties, including a requirement that the user provide a farm management plan. The plan is subject to monitoring and review.
901. Ms Mulcock then set out in detail a draft scheme management plan for HDI, which again we will not refer to here.

902. With regard to the template for a farm management plan, which is a requirement of the scheme management plan, Ms Mulcock said that this covers the following topics:

- Irrigation management
- Soils management
- Nutrient management
- Collecting animal effluent
- Biodiversity and ecosystem management
- Waterway and riparian management.

903. It is important to note that in the farm management plan the farmer undertakes to the scheme manager to comply with the conditions of consent granted by the regional council for the scheme as they relate to on-farm activities.

904. Users of HDI with existing irrigation schemes could be required to complete an evaluation of their irrigation activities to determine what upgrading, if any, is required in their systems. Ms Mulcock said it was envisaged that HDI would run workshops to assist water users to prepare their initial farm management plans. Water users would be required to keep records, including their nutrient budget and plan and fertiliser records and provide these to a scheme operator. There is provision for internal and third party auditing and detailed provisions for reporting and making reports public to the consent authority and the liaison groups.

905. Ms Mulcock then addressed a proposed environmental management fund that it is intended will be established for HDI in terms of the scheme management plan. This fund is intended to deal with changes and potential adverse effects from new irrigation development. It will be established through contributions made by the water users. The initial contribution is expected to be $2 per hectare per annum and potentially this initial contribution could provide a sum of $80,000 per annum. Ms Mulcock said that users who do work themselves on their own properties would qualify for a rebate of the levy.
906. Ms Muicock also said that with both the scheme management plan and the farm management plans it is desirable to have some flexibility, albeit that the preparation and contents of both plans will be tied in as a commitment to the conditions of the water consent. Flexibility is desirable because techniques are changing and developing all the time. Also, with regard to farm management plans, specific inputs like stock numbers and fertiliser application is difficult to determine and monitor at a scheme level. This should, of course, be done at the consent holder level.

907. Then too this irrigation scheme is likely to have its water users interspersed amongst properties that are not part of the scheme and it is difficult to determine in some cases who might be responsible, for example, for water quality. Ms Muicock said that it is an important principle of these proposals that the regulatory authority retains the ultimate control while provision is made for innovation and risk management through improving adaptive capacity.

908. In answer to a question from Commissioner Ryder, concerning what evidence there was that self regulation was better for the environment, Ms Muicock said that Fonterra has been developing nutrient budgets and management plans and a fertiliser Code of Practice has arisen out of this. Also suppliers’ representatives have been trained to use these management plan techniques when giving advice and those responsible for the HDI scheme were considering developing an irrigation design Code of Practice that she asserted could reduce water use by 20 percent.

909. Commissioner Ryder also asked Ms Muicock about the Canterbury mudfish, whose habitat, it is asserted, could be at risk if this proposal goes ahead. She said that it was envisaged that all permanent wetlands (which includes the mudfish habitat) are to be fenced and all stock excluded from waterways. In this way she asserted that there will be a limit as to what has to be assessed.

910. In answer to a question from Commissioner Bowden about dealing with non-point source contamination of groundwater, she advised – and we understand this to be the case - that there will be monitoring of the groundwater quality prior to the commissioning of the scheme. Ms Muicock said she understood the Regional Council already has a network of monitoring bores and wells in the command area and no doubt these could be used for that purpose.
911. In answer to questions from Commissioner Skelton, Ms Mulcock said that Meridian Energy Limited and South Canterbury Irrigation Trust, jointly will be the scheme manager. They will, of course, be the consent holders and that was the point of the question. It was intended that the scheme manager be the link between the users and the regulator with the scheme manager (more commonly known as HDI) being bound to comply with the conditions of consent. It was envisaged also that the independent auditor would be ASURE, which is a state-owned enterprise.

912. Something was made by this witness and others about the fact that the scheme manager would be able to exercise some authority over users who were in default by refusing to provide them with water in terms of their water agreement. Ms Mulcock was unable to say whether this had ever actually occurred.

913. Mr Ian Brown holds a Bachelor of Agricultural Science and Master of Agricultural Science Degrees from Lincoln University and he has had 30 years' experience in the farm management area. He has also had experience with regional councils. Since July 2004 he has been conducting his own consultancy business and he has over 10 years experience in auditable environmental farm plans.

914. Mr Brown gave evidence about the implementation and audit of the proposed farm management plans in this case. He has also had experience with the North Otago Irrigation Company's (NOIC) farm management plans. He said that land types in the area covered by the NOIC scheme are very similar to those found in the HDI; there is an element of commonality there. He also said that NOIC includes a water supply agreement as is proposed for the HDI scheme. These agreements require, as a condition of supply, that the farmer or user keep and comply with an up to date farm management plan. These provide contractual remedies in the event of non-compliance, identified through the audit process.

915. Mr Brown said the major area of difference between the NOIC regime and HDI proposal relates to the provision of a Scheme Management Plan which sets out the policies and procedures under which individual farm management plans must operate and he said the addition of such a Plan is an advance on the NOIC process.
916. Mr Brown went on to tell us that he did the first audits of the NOIC farm plans. 50 of the 70 properties in the scheme were audited and separate reports were prepared for each property. He attached a copy of one such report to his evidence as an exhibit. He said that the audit was based on the sighting of objective evidence in support of whether the scheme requirements had been met and the list of management practices had been followed based on records data and reports and the actual observations at the time of the audit.

917. Mr Brown went on to say that the NOIC farm management plans were prepared by the farmers during the spring of 2005 and irrigation did not commence until September 2006. The overwhelming majority had complied with their plans. Details of compliance were as follows:

- 88 percent used direct drilling
- 98 percent conducted regular soil testing
- 94 percent had a nutrient budget
- 100 percent of the dairy farmers were fully compliant with the Otago Regional Council’s permitted activity conditions for dairy effluent disposal.

918. Mr Brown said that there was still scope for further improvement. For example only 36 percent and 25 percent respectively demonstrated full adherence to irrigation and nutrient management policies. This, he said, was unacceptable.

919. For these proposals to work effectively good records need to be kept and some NOIC farmers did not fully appreciate this. The HDI scheme management plan seeks to address this issue directly. Education is also needed and the regulator should be involved. Mr Brown asserted that the HDI scheme management and farm management plan proposals are robust and will make a significant contribution to the achievement of the desired environmental outcomes. This is because they include an environmental management systems format, the cycle of continuous improvement, consent conditions require continual review of the plans at both scheme and farm level and also because of the audit process and the sanctions provided for in the supply agreements.

920. In answer to a question from Commissioner Skelton, Mr Brown said that he had never heard of a case where Fonterra had refused to collect one of its
Farmers’ milk in a case where the farmer was in breach of its agreement with Fonterra, as had been cited to us as an example of the kind of sanctions that could be provided for.

Conclusion

921. This evidence about scheme and farm management plans is important because as we have said more than once already particularly with required to potential adverse environmental effects in the HDI scheme area the applicants rely very heavily for their proposed mitigation on these plans being effective. We can say here that we were impressed by the evidence just summarised and particularly by the evidence of Mr Brown about what is actually happening on the ground in the NOIC scheme. That evidence is encouraging. Again, we will have more to say about management matters in our evaluation.

Discussion and Consideration of Legal Issues

922. Now that we have decided to apply the Allocation Plan minimum flow provision, there is no need to consider any further the evidence and submissions about the HDI proposal being a non-complying activity in any substantive way. There is one minor exception to this. Rule 15 of the Allocation Plan, provides that to be a discretionary activity an application has to comply with Rules 2, 6 and 7.

The findings we have made earlier in this decision mean that this activity will comply with Rules 2 and 6. However, it will not comply with Rule 7. This means that Rule 16 comes into play and because of this non-compliance or contravention, if indeed there is one, with Rule 7 the activity remains a non-complying activity to that extent.

923. Rule 7 in the Allocation Plan is intended to implement Policy 46 which has been discussed earlier in this decision in the context of reliability of supply for irrigation takes. This is where the 95 percent reliability has come from. It is accepted that Rule 7 cannot currently be enforced because it places an obligation on the consent holder for the Waitaki Dam to provide additional water at certain times of the year to meet the out of stream requirements in Policy 46 (ii). The consent holder for the Waitaki Dam is not required to comply until the consents for the operation of that Dam expire in 2025 and even then may not be required to do so. This is because the review powers contained in section 68 and section 128 and following of the RMA cannot be invoked by the Regional Council.
to require the consent holder of the Waitaki Dam to provide water for out of stream users. We record here that this was recognised by the Allocation Board when it made these provisions in the Plan.

924. Consequently we have a somewhat extraordinary situation where although Policy 46 should be given some weight, this is diminished by reason of the fact that it cannot yet be implemented.

925. However on the view that we have taken of this matter it does not need to be implemented because we have held that a reliable supply of water can be provided for the HDI scheme without having to implement that Policy and at the same time the minimum flow provided for by that policy and by Rule 2 of the Plan can be implemented. The principal reason for this is that the existing consent holders will continue to exercise their consents upon the terms and conditions already provided for and in practically all of those cases they do not have to comply with the 150 cumeecs minimum flow.

926. For these reasons the technical breach, as we see it, of Rule 7 which we emphasise can only be implemented by the consent holder for the Waitaki Dam will have no adverse environmental effects and the granting of this consent does not lead to the conclusion that it will be contrary, in the sense of being repugnant to or in opposition to, Policy 46. Therefore, for the purposes of section 104D of the RMA both threshold tests are met.

927. In earlier sections of this decision we have proceeded to reach conclusions on various factual issues based on the proposition that the minimum flow of 150 cumeecs is required to be met for this particular application. The conclusions we have recorded in those various sections will be applied in the next section of this decision.

928. Notwithstanding the foregoing, there remain some other legal issues that need to be addressed.

929. The first relates to a matter that was raised by Ms Gillian Ensor, the section 42A reporter for this application, about whether in this case the consent to use water should be granted pursuant to the Allocation Plan or the proposed NRRP and, in particular Chapter 5, which deals with water quantity matters. This issue arises because most of the HDI command area is outside the Waitaki Catchment as defined in the Allocation Plan. Ms Ensor expressed the view in her section 42A report that while the consent to take the water came within the
control of the Allocation Plan, the consent to use it for agricultural and horticultural purposes, or in other words irrigation, in the HDI command area was a matter to be considered and addressed in terms of the proposed NRRP.

930. This view was not supported by Ms Sarah Dawson, the applicants' planning consultant, or by any of the legal submissions that we heard on this particular matter at the hearing of this application.

931. In practical terms it probably makes little difference which way we rule on this now. Under the proposed NRRP the water use would be a discretionary activity and under the Allocation Plan, while technically it is a non-complying activity for the reasons just discussed, for all practical purposes it can be assessed as a discretionary activity as well.

932. Nevertheless it is a matter that we should address and make a ruling about.

933. Ms Appleyard, counsel for the applicants, submitted that Ms Dawson's view is correct. She also submitted that the Allocation Plan applies because it provides exclusively for the allocation of all the water resources in the Waitaki Catchment whether or not the water is to be used outside that Catchment. In this connection she referred first to page 19 of the Allocation Plan which states:

934. "The Plan applies to the taking, using, damming or diverting of water from the water bodies within the Waitaki catchment whether the water is used within or outside the catchment. Other matters should be addressed through the relevant statutory planning instruments of the regional and district councils."

935. Ms Appleyard then went on to submit that by reason of section 15 of the Resource Management (Waitaki Catchment) Amendment Act 2004 – the Waitaki Act – the proposed NRRP is limited to allocation issues outside the Waitaki Catchment.

936. Ms Appleyard also pointed out that the Allocation Plan addresses out of catchment activities in part, in Policy 12(h), where it refers to a preference for the needs for water within the Catchment and also Policy 14 specifically addresses situations such as the one we have here where we are required to consider or have regard to the extent to which granting this consent will reduce the availability of water to current and reasonably foreseeable in-catchment needs.

937. These provisions in the Plan do support the proposition that it is intended to apply to uses of Waitaki Catchment water outside that Catchment.
In her section 42A report Ms Ensor also referred to section 13 of the Waitaki Act which states:

"In carrying out its function under section 6, the Board must include objectives, policies and methods (including rules, if appropriate) in the regional plan to provide for—

water that is or maybe taken from, or used in, the Waitaki catchment in accordance with section 14(3), (b), (e) of the principle Act; and..."

In her submissions on this application, counsel for Fish and Game, Ms Camilla Owen, who supported Ms Appleyard's submission in this respect commented on the fact that Ms Ensor had cited this passage in support of her argument that the proposed NRRP applied. She pointed out that one needs to read the word "or" in section 13(a) of the Waitaki Act as a true disjunctive and not as a conjunctive which can sometimes be the case.

We agree with the submissions of Ms Appleyard and Ms Owen and, in our view, the Allocation Plan itself provides for all water "uses" relating to Waitaki Catchment water, that is to say all diversions, takes, uses, and damming of water whether to be used within or outside the Catchment. We note too that in fact a small part of the HDI command area is within the Waitaki catchment. Of course later, if and when this scheme comes to fruition and farmer users obtain water supplies from it and use that water for irrigation purposes this will be controlled by the relevant provisions of the proposed NRRP except, again, of course in that part of the command area that is within the Waitaki Catchment where again the Allocation Plan will apply.

This brings us quite neatly to another legal issue raised by Ms Owen and supported by her witnesses. In the HDI command area there is already quite a lot of irrigation, as we have stated elsewhere in this decision.

It was the contention of Fish and Game that if an existing permit holder wished to join the HDI scheme they should have to surrender their existing consent. This was opposed by the applicants because, as Ms Appleyard said, this could raise complications with consent holders trying to avoid this by subdividing their properties to take advantage of the rate of take per property. It would also discourage people from joining the HDI scheme. These, of course, are more merit arguments than legal arguments but Ms Appleyard went on to point out, and we accept, that in terms of the proposed NRRP Chapter 5, Rule
WQN26, an existing consent holder wishing to obtain water from this scheme and retain their existing consent would require a resource consent by way of a restricted discretionary activity in terms of that Plan.

945. It follows from this that there will be a significant measure of control of such situations through that process although, as we mentioned earlier, for that small part of the HDI command area within the Waitaki Catchment this may not be applicable. Nonetheless, for much the greater part of the command area it will be and in considering those restricted discretionary activity applications the consent authority will be required to have regard to the matters of efficiency of water use.

946. We conclude this particular matter by recording that there is no way that we could require existing consent holders to surrender their consents in any event and Ms Owen did not suggest such a way. What she wanted us to do, as we understood it, was to make it a condition of this consent that any existing consent holder wishing to join the scheme would have to surrender their existing consents. We think the legality of that is highly dubious and, of course in the light of Rule WQN26, quite unnecessary in any event.

947. The next legal issue we will consider is the applicability of Rule 4 of the Allocation Plan to this application.

948. This matter was raised by Mr M J Wallace, counsel for Te Runanga o Ngai Tahu and other local Runanga both at the hearing of this application and later at the hearing of the Lower Waitaki River applications.

949. The burden of the argument is that because abstractions from the Lower Waitaki River have or may have the effect of lowering the water levels in some wetlands that are reliant for their water on that River, this amounts to a diversion of water from those wetlands contrary to Rule 4 of the Allocation Plan and hence is a prohibited activity pursuant to Rule 13 of the Plan.

950. We are fortunate here that the Environment Court has recently made a ruling on this very point in its decision on an appeal by the Lower Waitaki River Management Society Incorporated concerning the NBTC hydro proposal.

951. In Lower Waitaki River Management Society Inc v Canterbury Regional Council Decision C080/09, the Environment Court was presented with the same argument as that put before us by Mr Wallace, only this time through a different party.
952. In the NBTC case the lowering of the water level in some wetlands was an effect that was beyond dispute. In this case and in the later Lower Waitaki River application cases the nature and extent of any such effects is less clear.

953. Be that as it may, the legal issue remains. If the effect of the HDI take of 20.5 cumecs was to lower the water level in a wetland is that a prohibited activity? The answer is given by the Environment Court in the above mentioned judgment, beginning at page 84, paragraph 173 and ending at page 90, paragraph 187 where the Court held that the taking of water by NBTC was not prohibited under Rule 4 of the Allocation Plan even if it did have the effect of reducing the water level in some wetlands.

954. We are of course bound by that ruling and we respectfully and gratefully accepted it and the reasoning leading to it for the purposes of determining this issue in these proceedings.

955. The next legal issue concerns the question whether the more appropriate process here would have been a plan change rather than a resource consent application.

956. This issue arose in the context of the proposal to reduce the low flow cut off from 150 cumecs to 100 cumecs. Since that is no longer the case there is no need for us to consider this issue any further. The application we are now considering and will reach conclusions on in the next section of this decision is an application that does not involve any departures from the Allocation Plan, except technically the failure to comply with Rule 7 (dealt with earlier in this section) and possibly the method of assessing flows at the Kurow recorder but neither of these would necessitate a plan change.

957. We come then to the matter relating to the Kurow recorder.

958. In Rule 2, Table 3, row xvii of the Allocation Plan, provision is made for the environmental flow regime for the Lower Waitaki River. As we have said already this includes a minimum flow from Waitaki Dam to the sea of 150 cumecs except in certain circumstances, which are not applicable here. This is the plan provision that also provides for the 90 cumec allocation limit. Row xvii then provides: "All flows in the Lower Waitaki River determined for the purpose of this item xvii are to be based on measurements at the Kurow recorder and based on one hour rolling averages."
959. In an earlier section of this decision concerning the control to be placed on
the taking of water for the purposes of protecting the Plan's minimum flow for the
Lower Waiatki River we have decided to adopt a 24 average for the relevant
Kurow recorder reading and we have already held that to do so will accord with
both thresholds in section 104D of the RMA. We confirm that ruling now.

960. Finally, we mention a matter that again was raised by Te Runanga o Ngaí
Tahu and other local Runanga at the hearing of this application. This concerns
the ownership of some land in the HDI command area known as the Fenton
Reserve Lands. We interpolate here that we heard about the Fenton Reserve
Lands and made reference to them in our decision on the NBTC proposal. This
evidence came from Mr Henare Rakihau Tau, one of the owners of the Fenton
Reserve Lands. He gave evidence about the history of these lands and asserted
that ownership gave the owners prior rights to the use of water. He went on to
say, however, that what he was really seeking was better consultation with MEL
(Meridian Energy Ltd) and he also told us that a working party had been set up to
try to identify all the owners. As we understood the position then and as we were
later told at the hearing of the present application, MEL is part of that working
party and indeed is footing the bill for this exercise. We recorded in our NBTC
decision that Mr Tau also told us that his group wished to find common ground
with MEL and avoid litigation.

961. At the hearing of this application an issue was raised about whether the
application had been properly notified under the RMA. It was asserted that all the
owners of the reserve lands needed to be notified and there was no evidence
that this had taken place. We comment here that this is hardly surprising
because not all the owners were then known. The evidence for the applicants
was that they had done their best to locate the owners and, as we had already
heard from Mr Tau, were still engaged in that exercise.

962. Ms Ritchie, who appeared with Mr Wallace as counsel for the Runanga, did
in the end acknowledge that there was no wish on the part of the Runanga to
hold up the hearing and determination of this application and in the end she and
Ms Appleyard, counsel for the applicants, agreed that in due course they would
file a joint memorandum on this issue. No such memorandum has been received.

963. Notwithstanding this we have proceeded on the basis of the advice given to
us by Ms Ritchie and, as we recall it now, also confirmed by Mr Wallace about
there being no intention to hold up the processing of this application and
accordingly we see no reason to take this matter any further for the purposes of this decision.

Discussion and Evaluation

964. This is the first stage of a proposal that could see the development of the second or third largest irrigation scheme in New Zealand.

965. We have accepted that there is a need for irrigation water in the HDI command area if pastoral farming and cropping are to develop and flourish.

966. We have also ruled that a reliable source of water from the Lower Waitaki River can be made available without compromising that Rivers environmental flow regime as provided for in the Allocation Plan. Subject to what we have said in the previous section about Rule 7, and possibly the Kurow recorder provision, this means we can assess this application in effect as a discretionary activity.

967. In terms of the Plan, were it to be such an activity, there are a number of matters to which we are required to have regard. First, there are the Plan's objectives: Objective 1 environmental qualities, Objective 2 the needs of water users, Objective 3 beneficial and adverse effects of allocating water, Objective 4 efficient use of water resources and Objective 5 relating to a practical and fair sharing of allocated water during times of low water flow which is a matter that we consider applies here and indeed has led to the formulation of the "banding" system or rather the extension of the system that already exists.

968. Then, in the context of this case the relevant policies in terms of Rule 15 of the Plan are Policy 9 mixing of waters, Policy 11 re effects, Policy 13 water quality, Policy 14 consideration of in catchment needs, Policies 15 and 16 efficient and effective use, and Policy 21 metering.

969. We do not think that Policies 23-27 apply here, but Policy 45 does because it is specific to the Lower Waitaki River. We have also referred earlier to Policy 46.

970. In general terms we think it should be apparent that throughout this decision we have had in mind the above mentioned Objectives in formulating the various conclusions on the factual issues and in particular we have been concerned to give effect to the weight that the Plan gives to the relevant matters in Objective 1 in relation to Objective 2. That is why we have spent a good deal of time in this
decision on the potential environmental effects of the HDI proposal particularly in
the command area and especially in relation to the Wainono Lagoon.

971. Turning to some more specific matters and the policies relevant to them we
address first the potential for the mixing of the waters which is a matter of
particular concern to the Maori interests represented at this hearing. In his
evidence Mr Lewthwaite detailed the steps that will be taken to ensure that there
is no direct discharge of water from the Lower Waitaki River into the waters of the
other catchments in the HDI command area and we accept that evidence. We
think the chances of this scheme offending Maori interests in this way are very
remote. This will be a tightly controlled scheme. The conditions proposed will
ensure that is the case.

972. On the topic of didymo entering these water bodies this is dealt with in the
sections of this decision concerning surface water and surface water quality and
the conclusions reached there will be referred to shortly.

973. We then turn to effects on the Lower Waitaki River. These include effects on
river morphology, ecological effects, water quality effects, effects on in-stream
habitats for benthic invertebrates and fish and also for birds.

974. On all these matters we have reached conclusions that are favourable to the
application including the issue about didymo where we have concluded that the
HDI scheme will not significantly increase the risk of didymo spreading in the
Lower Waitaki River.

975. We have also reached a favourable conclusion in relation to effects on
commercial and recreational users of the River and of course in our conclusion
about the flow regime we have taken account of the effects on existing users.

976. We then turn to the effects in the command area.

977. It will be apparent from other parts of this decision that the main focus of our
concerns with the HDI scheme following our decision to retain the environmental
flow regime for the Lower Waitaki River has been on the potential adverse effects
of that scheme in the command area. The positive effects of enabling an
additional 40,000 ha to be irrigated have also been addressed by us and we
accept they are significant.
978. The major adverse effect relates to the potential lowering of water quality and in particular ground water quality in the command area. There is also the possibility of increased flooding due to higher water levels.

979. On the latter we have concluded that monitoring of the situation will be required and that in the end, if such an adverse effect does eventuate reclassification of the drainage district may be necessary and that will be at the expense of those causing the adverse effect. We do not see this potential adverse effect as justifying refusal of consent.

980. We have come closer to such a conclusion with regard to the water quality issue. This has caused us to reflect long and hard on whether, in the end that might be the most appropriate outcome. There is no doubt on all the evidence we heard, that the HDI scheme will result in a lowering of water quality in the command area and as we said in our conclusion on this topic earlier in this decision we will have to weigh this against the positive effects of the Scheme. This we will do in the context of Part 2 of the RMA to which we now turn.

981. There are important natural values in the command area associated particularly with the Wainono Lagoon albeit that there is a mixture of views about whether it and its associated vegetation qualify for consideration under section 6 of the RMA. It will recalled that it is already a degraded wetland. Nonetheless it is, at least regionally, a significant wetland and even if it is degraded now it deserves recognition in a way that will at least reduce the prospects of further degradation. The Lagoon’s associated vegetation and habitats are equally deserving.

982. The applicants propose a number of measures in this regard. First there are the now quite comprehensive provisions for a Scheme Management Plan and for Farm Management Plans contained in the revised conditions. Then there are very comprehensive provisions for both pre- commissioning monitoring to establish environmental baselines and on-going post- commissioning monitoring and annual reporting to assess the actual effects of the Scheme as it develops and to identify mitigation measures.

983. Then too, the Scheme Management Plan establishes an Environmental Management Fund to which the water users will be required to contribute and this fund is to be used for mitigation of adverse effects on Wainono Lagoon and its associated vegetation as well as other areas such as rivers and streams and
their margins. The fund will also be used to establish wetlands and to protect the habitat of the endangered Canterbury mudfish in the command area.

984. The Farm Management Plans will also place significant obligations on the water users (the farmers) to farm in an environmentally acceptable way particularly with regard to the use of nitrogen and other aspects of water quality management. There are sanctions for failure to comply which would be in addition to any sanctions available to the Regional Council in terms of the proposed NRRP or possibly section 17 of the RMA.

985. It is also of importance to us that in terms of proposed condition 15 preferred by the applicants they are required to comply with and implement the Scheme Management Plan so that any failures in that regard will a breach of the consent.

986. Still considering section 6 of the RMA, as we said earlier in this decision Maori values need to be considered. We have already addressed the matter of the mixing of waters from different catchments and in so far as the Lower Waitaki River is concerned we did not understand the Runanga to be concerned about this proposal as it might affect that River provided the Allocation Plan flow regime was maintained. This is of course what will now happen. To the extent that Maori values in the HDI command area may be affected the measures we have just been discussing will relate to these and we also record that the conditions of consent require the consent holders to establish and maintain at their expense a Ngai Tahu Liaison Group as well as a Community Liaison Group and to engage with these groups in an ongoing way to deal with the effects of the Scheme and the outcome of the monitoring programmes earlier referred to.

987. These measures also address relevant matters in section 7 of the RMA to do with kaitiakitanga, and amenity values. On the latter we have also earlier recorded our acceptance of the assessments made by Mr Rackham and we have also reached favourable conclusions about commercial and recreational values.

988. On Treaty of Waitangi principles referred to in section 8 of the RMA, we do not recall any specific concerns being raised and given that we have now decided to maintain the Allocation Plan’s environmental flow regime we would be surprised if any such issues could arise.

989. This brings us to a matter relating to proposed condition 37 preferred by the applicants. This condition requires the consent holders to make a financial contribution to the Regional Council towards monitoring and mitigating any
adverse effects of the HDI scheme on the Lower Waitaki River downstream of the Scheme's intake. This condition was proffered by the applicants at a time when they were proposing and arguing for a lowering of the minimum flow in that River to 100 cumecs instead of 150 cumecs. The latter flow which is an integral and important part of the Allocation Plan's flow regime for that River is clearly intended to contribute (along with the other constituent parts of that regime) to the maintenance of the values that this proposed financial contribution were intended to address.

990. The Allocation Plan's regime will now remain intact and consequently we do see a need for condition 37. We propose to delete it accordingly. We think it is much more important, in the context of this case, that the applicants (who will become the consent holders) and the farmers who will be served by the Scheme, concentrate their efforts and their resources on the potential adverse effects of the Scheme in the command area. We hope the deletion of this condition will encourage this occur.

991. Having regard to all that we have now said throughout this decision but in particular the evaluations we have just been making we have concluded that, on balance, the purpose of the RMA will be achieved if we grant consent to this application on the terms earlier discussed.

992. This has been a difficult decision to make but we recognise the importance to the farmers and indeed to the nation of enabling additional irrigation water to be made available to this water short area of South Canterbury. In our judgment this can be done in a way that will provide an adequate measure of mitigation of any adverse effects that might arise. It is also important for us as we now said several times that the relevant provisions of the Allocation Plan remain intact.

993. Finally we must deal with an issue about the term of the consent we now propose to grant. The applicants seek a term of 35 years which is the maximum provided for by the RMA. Fish and Game, and the Lower Waitaki River Management Society sought a term of 15 years for all applications to take water from the River.

994. In this case given the nature and extent of the Scheme we think 15 years is quite unrealistic. The capital investment involved in this Scheme will be very large and providing such a short term would be a disincentive to actually proceeding with the Scheme at all. It would also be a disincentive for those considering
joining it. The fact that the Lower Waitaki River is no longer at risk if this scheme proceeds and the existence of the comprehensive environmental monitoring and mitigation measures now provided for in the command area on an ongoing basis, lead us to the conclusion that a term of 35 years is appropriate in this case.

Conclusion

995. For all the foregoing reasons this application to take and use water from the Lower Waitaki River for the purposes of the Hunter Downs Irrigation Scheme is granted subject to the terms and conditions set out in Appendix 6 annexed to this decision.

Dated at Christchurch this 27th day of April 2010

[Signature]

Peter Skelton
Commissioner and Chair

[Signature]

Michael Bowden
Commissioner

[Signature]

Gregory Ryder
Commissioner
APPENDIX 1

Before
The Canterbury
Regional Council

In the Matter
of
Applications by Meridian
Energy Limited and South
Canterbury Irrigation
Trust to divert, take and use
water from Lake Waitaki
and the Tower Waitaki
River

Minute of Commissioner Skelton

1. Meridian Energy Limited (MEL) has lodged applications for water permits in
connection with its proposed North Bank Tunnel hydroelectric generation
scheme in the lower Waitaki River. At the same time MEL and South
Canterbury Irrigation Trust (SCIT) have lodged joint applications for water
permits in connection with a proposed irrigation scheme known as the Hunter
Downs scheme.

2. In respect of the North Bank Tunnel proposal there are four applications as
follows:

   An application to divert and take water from Lake Waitaki. Appl.CRC071094.

   An application to use water from Lake Waitaki for hydroelectricity
generation. Appl. CRC071139

   An application to discharge water into water from an outfall to the
Waitaki River. Appl. CRC 071096

   An application to discharge water to land in circumstances where it
may enter water from an outfall to land namely Crown riverbed Appl.
CRC071878

3. In respect of the Hunter Downs scheme there are three applications as follows:

   An application to divert water from the Waitaki River.
   Appl.CRC071033

   An application to take and use water from the Waitaki River for
irrigation. Appl.CRC071029