

From: [Alicia Brunkle](#) on behalf of [Alex Booker](#)
To: [Plan Hearings](#)
Subject: Plan Change 7 - Templeton Pegasus Ltd - evidence
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Attachments: [Al Toitū CarbonZero_480px1.png](#)
[Statement of Evidence - Andrew Webster \(Templeton Pegasus Ltd\).d.pdf](#)

Hi Tavisha

Please find **attached** for filing on behalf of Templeton Pegasus Limited:

- Statement of Evidence - Andrew Webster (company representative)

Attachments to Mr Webster's evidence can be found in the Share File link below.

Share File Link:
https://files.al.nz/public/folder/txz5Mg2M0K0xn1W2_XKw/Statement%20of%20evidence%20of%20Andrew%20Webster%20for%20Templeton%20Pegasus%20Limited%20with%20attachments

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Regards
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IN THE MATTER OF the Resource Management Act 1991

AND

IN THE MATTER OF Applications by **Pegasus Town Limited** for land use consent Application RC055800 to the **Waimakariri District Council**;

and Applications CRC062168, CRC062169, CRC062170, CRC062173, CRC062174, CRC062175, CRC062177, CRC062178, CRC062179, CRC062181, CRC062183 & CRC062184 for land use, water permit and discharge permits to the **Canterbury Regional Council**.

Decision of the Hearing Commissioners Mr Paul Rogers (Chair) and Dr Brent Cowie

Appearances

Applicant

- Ms Lauren Semple – Counsel – Anderson Lloyd Cauldwell
- Mr Graham Levy, Beca Infrastructure Limited
- Ms Ann Williams, Beca Infrastructure Limited
- Mr David Gardiner, Beca Infrastructure Limited
- Mr Timothy McMorran, URS
- Dr Eric van Eyndhoven, Boffa Miskell
- Mr Te Marino Lenihan
- Dr Daniel Witter
- Mr Marc Bretherton, Mitchell Partnerships

Submitters

- Mrs Jo Kane
- Mr Don Young, Waimakariri District Council
- Mr Brian and Mrs Anne Stokes
- Mr G L Sandrey
- Mr William Wilson on behalf of the Waikuku Water Users Group
- Mr William Wilson on behalf of Waikuku/Rakahuri River and Coastcare Group
- Te Kohaka o Tuahitara Trust
 - Mr Alan Jolliffe
 - Dr John Scott
 - Mr Maurice Duncan, National Institute of Water and Atmospheric Research (NIWA)
 - Dr Catherine Chague-Goff, NIWA

Reporting Officers

- Mr Andrew Brough and Ms Hilary Lough, Pattle Delamore Partners (Canterbury Regional Council reporting officers)
- Mr Garry Blay, Waimakariri District Council reporting officer

1 Introduction

1. This is the joint decision of a hearing committee comprising Mr Paul Rogers (chair) and Dr Brent Cowie appointed to hear and decide applications to the Waimakariri District Council (WDC) and the Canterbury Regional Council (CRC; commonly known as ECan) for a suite of consents to enable the future development of Pegasus Town to the east of Woodend. In broad terms the consent applications relate to the development of a recreational lake and wetland conservation area, the disposal of stormwater from the various parts of the site, and land development.
2. Mr Rogers, who is a partner specialising in resource management and environmental law in the law firm Anthony Harper, was appointed a joint hearing commissioner by both Councils. Dr Cowie, who is a resource management consultant, was appointed only by the CRC. We had previously heard and granted consents for the development of the Mapleham golf course and its associated facilities and housing enclaves. Mapleham is to the immediate north west of Pegasus Town, and the main access road to Pegasus passes through the golf course.
3. We heard the applications in the Council Chambers of the WDC in Rangiora on Wednesday 7 – Friday 9 June 2006. The hearing commenced at 0930h each day. We adjourned the hearing at approximately 1510h on Friday 9 to allow the written right of reply from the applicant's legal counsel. The applicant sought 15 working days for that reply, a request we granted. The written right of reply was received on 30 June and was circulated to parties who submitted on the application. No further written comment was received.
4. We inspected the subject land on the morning of Friday 9 June prior to the hearing commencing that day. We were shown around the Pegasus town site in a four wheel drive vehicle by Mr Shane Fairmaid, the Project Manager for Pegasus Town Limited. We were also accompanied on that visit by Dr John Scott, a submitter and Trustee of Te Kohaka o Tuhaitara Trust. We were shown the general layout of the site, and the trial lake already excavated as part of the site development. Dr Cowie separately went and examined the environs to the east of Tutaepatu Lagoon.
5. We closed the hearing on 20 July 2006.

2 Background to the Applications

2.1 The Applications

6. On 15 December 2005 Pegasus Town Limited (PTL; the Applicant) applied to the CRC and the WDC for water permits, discharge permits and land use consents related to the subdivision and subsequent development of Pegasus Town. The applications were accompanied by a comprehensive Assessment of Environmental Effects prepared by a variety of consultants to the applicant. It was also accompanied by a variety of plans, including a concept plan that we will refer to later in this decision.
7. Both the CRC and the WDC requested further information from the applicant under the provisions of Section 92 of the Act. We were told that prior to the hearing the applicant also undertook lengthy discussions with representatives of the WDC, who had submitted comprehensively on the applications to the CRC.

8. The consent applications to the CRC were as follows:
- **CRC062168** – to clear vegetation and disturb soil within the existing wetlands and riparian margins of streams of the Pegasus Town site for the purposes of construction works and subsequent subdivision and development of Pegasus Town.
 - **CRC062169** – to excavate material within the beds of unnamed waterways, at or about map reference NZMS 260 M35:8648-6655, within the Pegasus Town site, for the purposes of road construction and the creation of new waterways and wetlands in the Conservation Management Areas.
 - **CRC062170** – to place structures within the bed of the proposed lake, and structures within the bed of the proposed waterways and/or wetlands within the Conservation Management Areas, at Pegasus Town. To install silt traps at or about map references NZMS 260 M35:85845-67677, NZMS 260 M35:85863-66115, NZMS 260 M35:85707-65370; adjustable weirs at the outlets of the lakes, at or about map references NZMS M35:85810-66675 and NZMS M35:85650-66070; a stop-log control structure, at or about map reference NZMS M35:85650-66070; and a hand operated overflow gate, at or about map reference NZMA 260 M35:85650-66070.
 - **CRC062173** – to restore the existing wetlands in the proposed Conservation Management Areas at Pegasus Town.
 - **CRC062174** – to excavate and disturb land for the purposes of constructing a lake, and the proposed waterways and wetlands of the Conservation Management Areas, at Pegasus Town.
 - **CRC062175** – to discharge water, and contaminants, to water during the construction of the proposed lake, and the waterways and wetlands of the Conservation Management Areas at Pegasus Town. The discharges will be to unnamed drains at or about map references NZMS 260 M35:85845-67677; NZMS 260 M35:85863-66115; NZMS 260 M35:85707-65370.
 - **CRC062177** – to discharge contaminants or water into water from the lake outlets to the Eastern Conservation Management Area, at or about map references NZMS 260 M35:85810-66675 and NZMS 260 M35:85650-66070 (at a rate of up to 750 litres per second) at Pegasus Town.
 - **CRC062178** – to discharge contaminants and or water into land in circumstances which may result in those contaminants (or any other contaminant emanating as a result of natural processes from those contaminants) entering water from the Eastern Conservation Management Area wetlands to land to the south of the Conservation Management Area, at or about map reference NZMS 260 M35:85707-65370, at Pegasus Town.
 - **CRC062179** – to discharge contaminants onto or into land in circumstances which may result in those contaminants (or any other contaminant emanating as a result of natural processes from those contaminants) entering water and to discharge contaminants into water, at or about map reference NZMS 260 M35:86318-66929, at Pegasus Town.
 - **CRC062181** – to take and use groundwater at a rate of up to 750 litres per second at or about map references NZMS 260 M35:8542-6614; NZMS 260 M35:8648-6655; and NZMS 260 M35:8478-6618.
 - **CRC062183** – to take and/or divert surface water from existing drains and wetlands to create the new waterways and wetlands proposed for the Conservation Management Areas, at Pegasus Town.

- **CRC062184** – to dam water within the waterways and wetlands of the proposed Conservation Management Areas, at or about map references NZMS 260 M35:86318-66929 and NZMS 260 M35:8478-6618, at Pegasus Town. To dam water within the proposed lake, at or about map references NZMS 260 M35:85810-66675 and NZMS 260 M35:85650-66070, at Pegasus Town.
9. All consents were sought for 35 years, with a 10 ten lapse period sought under the provisions of s125 of the Resource Management Act 1991 (the RMA).
 10. An application was also made for a bore permit to cover the excavation of the lake to below groundwater, but this was considered unnecessary. Other resource consents from the CRC may also be necessary for the complete development of Pegasus Town. These include the possibility of a take of deep groundwater for domestic supply for the town. The use of chemicals such as glycoposphate to kill existing willows in the Eastern Conservation Management Area may also need consent. No consent is necessary for sewage disposal as the town will be serviced by the WDC ocean outfall that has just been constructed off the north of Pines Beach.
 11. The consent application to the WDC was:
 - for a land use consent to undertake earthworks, exceeding 5ha in area at any one time, for construction of the lake and contouring of the site preparatory to development works for residential purposes. It was given the processing number RC 055800.

2.2 Description of the Proposed Activities

2.2.1 The Present Environment

12. In general terms the proposed Pegasus Town development comprises a new town of approximately 1,700 residential allotments and a commercial/business area comprising some 200 allotments. The town will have a lake, community facilities such as a school, parks and reserves, and three conservation management areas. Only one of those conservation management areas – the Eastern Conservation Management Area (ECMA) - is relevant to the present consent applications.
13. The site is located between State Highway 1 and the coast about 1.5km north of the existing Woodend Township. The topography of the site is generally flat towards the coast on the east, whereas towards the east there are old sand dunes up to about 8m high.
14. The soils on the site are dominated by highly permeable sandy soils, with some silt, clay and peat fractions present. The present dunes run approximately parallel to the coast. Between them are areas of former estuarine wetland that historically will have formed part of the Ashley River estuary. These were drained long ago for agricultural use. Little run-off occurs from the site because of the permeability of the soils.
15. In the recent past land use on the site has been a mix of exotic pine forest towards the west, and grazing of sheep and cattle on the more dry pasture towards the east. The exotic forest is presently being logged, under the supervision of an archaeologist and rununga representatives, to provide for future development. There are some residual areas of impeded drainage towards the east of the site, and these are presently infested by vegetation that is adapted to wet conditions, such as willows, rushes and

sedges. To the east of the site the more inland coastal dunes are largely planted in pine trees.

16. Surface drainage is north towards the Taranaki Stream and the Ashley River via what is known as the interdune drain along the eastern margin of the site. The mouth of the Taranaki Stream is controlled by a floodgate under the stopbank which prevents water from the Ashley River flowing back up the stream during the higher phases of the tidal cycle, and during floods in the river.
17. The site is underlain by shallow groundwater at a depth of 2 - 2.4m RL. Some of this water emerges as seepage in the interdune drain. Groundwater flow is from west to east (i.e. towards the coast). Several deeper aquifers are also present. It is assumed that these emerge offshore.
18. To the south of the site and about 500m from the coast is an old wetland feature known as Tutaepatu Lagoon. The lagoon was vested in Ngai Tahu as part of the Treaty Settlement in 1998. It drains both south towards the Waimakariri River, and to a smaller extent north towards the inter dune drain and from there to the Taranaki Stream. The margins of the lagoon are heavily infested with willows, and it has been known to dry out in drought years (such as summer 1998).
19. The limited sampling carried out has shown existing water quality in both the interdune drain and Tutaepatu Lagoon is degraded, with high turbidity, elevated nutrient levels, high levels of iron and manganese and high faecal coliform counts.

2.2.2 The Proposed Development

20. The proposed Pegasus Township is already provided for by zoning in the Operative Waimakariri District Plan (OWDP). The zones are Pegasus Rural, Residential 6, Residential 6A and Business 1. The total site covers some 285ha, of which the town centre will be about 11ha, and about 94ha will be developed for residential sections
21. The OWDP sets out at Policy 18.1.1.11 the principles on which the development of a new town at Pegasus is provided for. Those principles are comprehensive, with particular emphasis given to the exceptional natural and cultural values of the subject site and the land surrounding the subject site. The OWDP seeks to ensure that those values will be retained and enhanced as integral features of the town's character and amenity values. In doing so it requires that the applicant provide for
 - The formation of a lake covering some 14.1ha as part of the development, with a water level of 1.2 -1.5 m RL.
 - The creation of the ECMA along the eastern boundary of the site.
 - The creation of a Mudfish Conservation Management Area (MCMA).
 - A minimum floor level for all properties of at least 3.85m RL, which equates to protection for a 0.2% Annual Exceedance Probability (AEP) event (in other words a storm with a return period of 500 years or more) plus 170 mm freeboard.
 - Stormwater disposal be by distributed ground soakage.
22. The proposed town has been extensively marketed, with a large model built, and at least 500 sections have already been sold. All sites will be served with telephone, electricity and gas connections.

23. There are no existing houses on the site. There is one house on an immediately adjacent lot to the northwest of the site. No other houses are located within 500m of the property boundary.
24. The development of the town is planned to occur in stages. The first stages to be developed will be residential areas towards the south west of Pegasus. Ongoing development work will be occurring on the balance of the site while these early stages are being subdivided and houses built upon them.
25. The applicant considers that there will be no net requirement for fill on the site, nor will any cut need to be carried away. This is because they estimate that the material excavated and otherwise available on the site will balance the requirement to provide an elevation for all sections of at least 3.85m RL. In saying this there will however be a large volume of gravel and asphalt brought on to the site to provide for roads and other hard standing surfaces. The Applicant estimates that this will be 175,000 cubic metres for roading and stormwater soakage, plus an allowance for lining of lake.
26. Access to the town will be via a high standard intersection on SH 1, approximately 600m north of the 70km/h speed limit boundary at the northern end of Woodend. This main roading connection will cater for all external traffic movements to and from Mapleham and Pegasus.
27. The consents sought can be grouped into several categories as follows.

Land Clearance on the Site

28. The consent application to the WDC is to allow earthworks covering more than 5 ha on the site at any one time. These earthworks will not necessarily be contiguous, as the Applicant proposes to carry out construction works on different parts of the site at the same time. We note in this context that the forest clearance being undertaken to the west of the site has already exposed large areas of bare sand and earth.

Excavation, Construction and Restoration

29. Six of the consents sought are to allow the excavation and construction of the lake, and the clearance of existing vegetation in the ECMA, and its subsequent excavation, construction and restoration. These are CRC062168 – 062170, and CRC 062173 – 062175 inclusive.
30. The lake will be a feature of the Pegasus development. It will be about 800m long, about 200m wide at its widest point and more or less parallel to the coast. The lake is proposed to have a maximum depth of 3.5m, with shoreline batters of between 1:10 and 1:20 around most of the shore. A trial lake, covering some 0,3ha, has already been excavated, and its water quality monitored.
31. The eventual quality of water in the lake, and what it will be able to be used for as a result, are somewhat problematic and are matters we discuss in detail later in this decision. Suffice to say at present that some elements of water quality and other values of the lake are able to be largely controlled by the applicant (e.g. the quality of the stormwater discharges that will enter the lake) and some are largely outside of the applicant's control (e.g. the quality of the groundwater entering the lake and the composition and size of resident or migratory bird populations).

32. Once excavated, the lake will naturally fill with shallow groundwater. This is because the lake, the ECMA, the interdune drain and the shallow groundwater are all part of the same hydraulic system. We will discuss this in some detail later as the rate at which groundwater will enter the lake, and whether or not this constitutes a “take” of groundwater (in the sense of section 14 of the RMA), are matters that are also somewhat problematic.
33. The former wetland that will become the ECMA covers an area of about 97ha. It will be excavated to a maximum depth of about 1.5m. The residual wetland is a highly modified environment that has been extensively grazed by sheep and cattle until very recently. It contains five broad vegetation types: willow, damp pasture, sedge swamp, short rushland and tall rushland. Endangered species such as Australasian Bittern and Canterbury Mudfish have been recorded from the existing remnant wetland, as have a number of plant species that are uncommon in Canterbury.
34. The applicant proposes to remove the existing exotic vegetation, particularly willows, and then excavate the ECMA in stages. Silt traps will be used during excavation, and fish will be trapped and moved off site prior to work starting. Work will be carried out in stages, and each area will be restored as soon as practicable thereafter.
35. We need not detail the restoration of the ECMA here. The main objectives are habitat restoration, biodiversity enhancement, recreation, protection of historic values and awareness and education. The main plant communities to be restored will include native aquatic macrophytes, wetland turf, reedlands and raupo, sedges, flaxes, forest and shrub land and dune top shrubs and tussocks in the drier areas. Only native species will be planted. It is anticipated that once completed the ECMA will be representative of the native community that existed on the site prior to human interventions, and that it will provide quality habitat for a variety of native fish and birds.

Discharges from the Lake and the ECMA

36. Drainage water from the lake will discharge via two outlets to the ECMA, so water quality in the ECMA will depend in part on water quality in the lake. Once excavated, the ECMA will also fill with shallow groundwater, and in due course it will receive drainage water from the lake. Drainage from the ECMA will be primarily from its south end to the inter dune drain, and there is the option of providing some drainage water to Tutaepatu Lagoon. There is another outlet towards the north end the ECMA. The inter dune drain then flows north to the Taranaki Stream.
37. Consents are also sought to dam both the lake and the ECMA to control levels in these two water bodies. The levels at which the lake and the ECMA will be controlled is a matter we discuss in considerable detail later in this decision.

Discharges of Stormwater

38. The applicant has proposed a comprehensive stormwater treatment and management system. This has been designed to meet the standards in the Auckland Regional Council’s Technical Publication 10 (ARC TP10). This is a standard widely adopted by local authorities for stormwater management in New Zealand, and it has been adopted as a code of practise by the WDC.
39. All discharges of stormwater are primarily to ground soakage. The only direct discharge of stormwater to water is proposed to be from the town centre, where in the event of a storm with a <10% AEP (Annual Probability of Exceedance - in other words

a storm with a return period of greater than 10 years), some untreated stormwater will discharge directly to the lake.

40. There are three main components to the stormwater treatment system as follows.
41. The town centre has the greatest proportion of impervious surfaces. Stormwater will be collected in a piped system, treated first in catch pits to remove coarse sediment and grit, and then treated comprehensively via sand filters with a total proposed volume of 1,640 m³ prior to final discharge to ground. The catch pits provided here (and elsewhere in the treatment system) are designed to allow ready maintenance.
42. Detailed design of the sand filters will be undertaken at the time of detailed engineering approvals. As noted above, there will be a direct discharge of stormwater to the lake during high intensity events, but this will be overflow water and comprehensive treatment will always be provided to the “first flush”.
43. Discharges from roads and other impervious surfaces will be treated first in swales alongside roads, which will use soil and sand media and will act as infiltration strips. Once the swales are full, stormwater enters a catchpit with a geotextile insert to capture sediment and litter, before entering gravel soakage trenches prior to final discharge to shallow groundwater. It is expected that the swales may need to be remediated by skimming off the top layer of contaminated soil about once every 20 years or so.
44. Discharges from roofs and sometimes other impervious soils on individual properties will be to soak pits with geotextile linings prior to discharge to ground. To ensure consistency, all soak pits will be installed by the applicant. Treatment will not be to ARC TP10 standards as this is not required because of low contaminant loadings. Some source control will be carried out by prohibiting the use of zinc based roofs in the town.
45. The lake and the ECMA are regarded as part of the “treatment train” of the stormwater, with both functioning as oversized wet ponds under ARC guidelines.

2.3 Notification and Submissions Received

46. The applications to the CRC were publicly notified in “the Press” on Wednesday 8 February 2006, apart from CRC 062181 which was notified on February 11. The applications to the CRC were notified as follows:

<p>Applicant: Pegasus Town Limited Address: c/o Mitchell Partnerships, PO BOX 489, Dunedin Attn: Marc Bretherton</p>
<p>CRC062168 – to clear vegetation and disturb soil within the existing wetlands and riparian margins of streams of the Pegasus Town site for the purposes of construction works and subsequent subdivision and development of Pegasus Town.</p>
<p>CRC062169 – to excavate material within the beds of unnamed waterways, at or about map reference NZMS 260 M35:8648-6655, within the Pegasus Town site, for the purposes of road construction and the creation of new waterways and wetlands in the Conservation Management Areas. The unnamed waterways consist of a series of existing farm drains that flow in a generally northerly direction towards the Taranaki Stream and Ashley River. It is proposed to construct a road that will access the beach and crosses these drains. The drains are located in the proposed Eastern Conservation Management Area.</p>

<p>CRC062170 – to place structures within the bed of the proposed lake, and structures within the bed of the proposed waterways and/or wetlands within the Conservation Management Areas, at Pegasus Town. The proposal includes the placement and installation of the structures associated with the proposed roads, and the following structures for the protection of waterways during construction and to control water levels in the proposed lake:</p> <ul style="list-style-type: none"> • silt traps, at or about map references NZMS 260 M35:85845-67677; NZMS 260 M35:85863-66115; NZMS 260 M35:85707-65370 • adjustable weirs at the outlets of the lakes, at or about map references NZMS 260 M35:85810-66675 and NZMS 260 M35:85650-66070 • stoplog control structures, at or about map reference NZMS 260 M35:85650-66070 • a hand operated overflow gate, at or about map reference NZMS 260 M35:85650-66070.
<p>CRC062173 – to restore the existing wetlands in the proposed Conservation Management Areas at Pegasus Town. Restoration will involve the planting of predominantly indigenous plants.</p>
<p>CRC062174 – to excavate and disturb land for the purposes of constructing a lake, and the proposed waterways and wetlands of the Conservation Management Areas, at Pegasus Town. Land will be excavated over an area of 14 hectares and to achieve a water depth of approximately 3.5 metres for the proposed lake. For the creation of the waterways and wetlands of the Conservation Management Areas, land will be excavated to an approximate depth of 1.5 metres. These excavations will involve the interception of groundwater.</p>
<p>CRC062175 – to discharge water, and contaminants, to water during the construction of the proposed lake, and the waterways and wetlands of the Conservation Management Areas at Pegasus Town. The discharges will be to unnamed drains at or about map references NZMS 260 M35:85845-67677; NZMS 260 M35:85863-66115; NZMS 260 M35:85707-65370</p> <p>The main contaminant discharged from these activities will be suspended sediments.</p>
<p>CRC062177 – to discharge contaminants or water into water from the lake outlets to the Eastern Conservation Management Area, at or about map references NZMS 260 M35:85810-66675 and NZMS 260 M35:85650-66070 (at a rate of up to 750 litres per second) at Pegasus Town. Potential contaminants in the discharge may include suspended sediments, heavy metals, hydrocarbons, pathogenic micro-organisms and nutrients.</p>
<p>CRC062178 – to discharge contaminants and or water into land in circumstances which may result in those contaminants (or nay other contaminant emanating as a result of natural processes from those contaminants) entering water from the Eastern Conservation Management Area wetlands to land to the south of the Conservation Management Area, at or about map reference NZMS 260 M35:85707-65370, at Pegasus Town.</p>
<p>CRC062179 – to discharge contaminants onto or into land in circumstances which may result in those contaminants (or any other contaminant emanating as a result of natural processes from those contaminants) entering water and to discharge contaminants into water, at or about map reference NZMS 260 M35:86318-66929, at Pegasus Town.</p> <p>The discharge will be stormwater from business areas, residential areas and residential roads. Runoff from residential areas and roads will be treated and discharged to land via swales, coarse grit traps, and gravel soakage basins. Town centre runoff will be discharged to land via sand filters prior to discharging to the proposed lake. In storm events greater than a ten-year return period, residential stormwater may be discharged directly to the proposed lake. Potential contaminants in the stormwater may include suspended sediments, heavy metals, hydrocarbons, pathogenic micro-organisms and nutrients.</p>
<p>CRC062181 – to take and use groundwater at a rate of up to 750 litres per second at or about map references NZMS 260 M35:8542-6614; NZMS 260 M35:8648-6655; and NZMS 260 M35:8478-6618. Water will be used for the purposes of the construction and on-going operation of the proposed lake and the waterways and wetlands of the Conservation Management Areas.</p>
<p>CRC062183 – to take and/or divert surface water from existing drains and wetlands to create the new waterways and wetlands proposed for the Conservation Management Areas, at Pegasus Town.</p>
<p>CRC062184 – to dam water within the waterways and wetlands of the proposed Conservation Management Areas, at or about map references NZMS 260 M35:86318-66929 and NZMS 260 M35:8478-6618, at Pegasus Town. To dam water within the proposed lake, at or about map references NZMS 260 M35:85810-66675 and NZMS 260 M35:85650-66070, at Pegasus Town.</p> <p>The dams will include weirs that will be used to control water level variation within the lake and Eastern Conservation Management Area. At the lake, low concrete weirs (about 1.5m high) and culverts will control outflow through an excavated channel to the Eastern Conservation Management Area. At the Eastern Conservation Management Area, low earth bunds and weirs (generally less than 1m high) will assist in directing discharge to the existing downstream unnamed waterways.</p>

47. The CRC also notified a total of 61 parties and persons considered to be directly affected by the application.

48. Sixteen submissions were received on the applications within the 20 working day submission period. Of these, 10 submissions were received opposing the applications, and all 10 submitters wished to be heard in support of their submissions.
49. The main concerns raised by submitters (particularly the Roding and Utilities Group of the WDC who made a very comprehensive submission) were as follows:
- (a) **Planning** – there were a number of issues raised by submitters regarding the planning and long term sustainability of the proposed development including:
- *Levels of information* – submitters thought that there was insufficient information provided on the full extent of the infrastructure which has resultant implications for assessing the ongoing level of commitment, cost, and liability of any future operator.
 - *Terms of consent* – submitters felt that the application should assess the sustainability of the system beyond the 35 year term of consent applied for.
 - *Reliance on management plans* – submitters argued that the proposal was heavily reliant on the use of management plans as an environmental management technique, and that the application lacked necessary detail on the actual performance of the stormwater systems.
 - *Affordability* – concerns were voiced as to the cost to the community of maintaining the infrastructure of the town. One submission stated that the proposal lacked any life cycle analysis of infrastructure or performance related assessment.
 - *Ownership and liability* – ultimately it is intended that long term ownership of the stormwater system is to lie with Waimakariri District Council. There were concerns regarding the uncertain timing or framework of the transfer of ownership and the costs and liability associated with ownership of the system.
 - *Conditions of consent* – submitters were keen to ensure that consent conditions were pragmatic, effective and enforceable.
 - *Lack of integration between consents* – one submitter regarded the lack of integration between the resource consents as being inconsistent with good planning outcomes.
- (b) **Conflict with statutory documents** – there was concern from a number of submitters that the applications were contrary to the purpose of the Resource Management Act 1991, Sections 5, 6 and 7, and contrary to the objectives and policies of the Canterbury Regional Policy Statement. There was no indication as to how the submitters felt that the applications contradicted these statutory documents.
- (c) **Stormwater Treatment System** – the role and performance of the various components of the stormwater treatment system were some of the main concerns raised by submitters. Submissions requested that more detail be provided on the effectiveness of the different components of the stormwater treatment system such as the swales, gravel soakage drains and the lake. There was some concern as to the role of the lake i.e. whether the lake was part of the treatment system or

whether it was part of the receiving environment. One submitter claimed that the concept of an artificial lake to accommodate stormwater runoff was unprecedented and environmentally unsound. There was also concern about the depth of water on roadways used to convey secondary flows to discharge points at the lake. Submissions also called for further information on the effectiveness of sand filters at removing contaminants contained in stormwater.

- (d) **Maintenance of Stormwater Treatment System** – submitters were concerned that there was a lack of information provided on the operation and maintenance requirements of the proposed swales, grit traps, wetlands, gravel soakage beds or sand filters and that the extent of maintenance required for the system would be greater than what could be reasonably expected from any future owner of the system.
- (e) **Groundwater** – concerns regarding groundwater focused on the effects that the development may have on groundwater levels, flow paths, quantity and quality, and monitoring. One submission also detailed concern regarding the effect that abstracting groundwater would have on existing groundwater users.
- (f) **Wetlands** – one submitter was concerned that the cost of maintaining the ‘small wetlands’ which are intended to treat stormwater at the point of discharge into the lake, may outweigh the environmental benefits that there are designed to provide. The submitter felt that the costs and benefits of alternative options to wetland should be explored.
- (g) **Flooding** – one submission raised the issue of possible downstream flooding effects in the Taranaki Stream. Other submitters also raised flooding as a concern, but did not provide an indication of how the issue was of concern to them.
- (h) **Lake margin safety** – a submitter had concerns that the Applicant had not been explicit in addressing the issue of public safety around the margins of the lake. This concern stemmed from the fact that should WDC assume responsibility for the lake then it will be responsible and potentially liable for the safety of residents around the margins of the lake.
- (i) **Cross boundary/downstream effects** – a number of submitters raised concerns that the Pegasus development has the potential to impact negatively on Tūtaepatu Lagoon or Taranaki Stream in terms of water quality and quantity. There was also concern about the lack of information in relation to the cross boundary effects of the development in relation to the ECMA. A submitter also voiced concern about pollutants or sediments generated from the development affecting Salt Water Creek.
- (j) **Geotechnical aspects** – a number of submitters were concerned about the geotechnical implications associated with the development, namely the potential for ground liquefaction or lateral spreading of soils during seismic events and soil compaction. One submitter was also concerned about the insurance implications of building in an area that was seismically active.
- (k) **Environmental Risk Assessments** – one submission noted that neither a geotechnical nor an environmental risk assessment had been completed as part of the applications. The submitter identified four issues (but were not limited to) that should have been included in an environmental risk assessment. These included changing groundwater levels, seismic events and tsunamis, climate change and sea level rise, and reduction in the efficiency of primary stormwater treatment systems.

- (l) **Earthworks, construction and construction materials** – several submissions expressed concern about the large volumes of construction materials required. In particular, one submitter felt that the application contained insufficient detail on the material balance, i.e. whether or not the material excavated on site will be suitable for the use in building platforms to provide adequate protection against groundwater flooding. The issue of the disposal of any unsuitable excavated material was also raised. A separate submission voiced concern about the potential for noise and dust generation during earthworks, especially should the bulk earthworks coincide with undesirable weather conditions.
- (m) **Wildlife Management** – there was one submission which raised a variety of concerns regarding the potential disturbance of indigenous flora and fauna during the construction and existence of Pegasus Town.
- (n) **Description of the receiving environment** – one group of submitters stated that there was inadequate description of the receiving environment, in particular the applications contained no evidence that the sediment and soils of the area had been mapped.
- (o) **Loss of soils and soil erosion** – there was fear that the development would result in the loss of what the submitter considered to be top quality soil that could otherwise be used for farming. Another submitter was concerned that the felling of trees would expose large areas of sand.
- (p) **Roading and traffic congestion** – one submitter stated that roading was of concern. Another submitter stated that traffic congestion would lengthen a commuter's day.
- (q) **Air pollution** – one group of submitters were concerned about the air pollution which may result from the burning of felled trees and tree stumps.
50. Other general concerns which were touched upon included health and safety issues, climate change, global warming, sea level rise, and other unspecified unforeseen events.
51. Submitters opposing the applications requested the following actions from the CRC:
- (a) Decline the applications outright.
 - (b) Decline the applications until issues raised in submissions have been successfully resolved.
 - (c) To ensure that the stormwater system is sustainable, effective and efficient in managing stormwater in and around Pegasus Town.
 - (d) To include monitoring conditions in the consents which are achievable and affordable.
 - (e) If consent were to be granted, conditions requiring that:
 - That no burning of felled trees or stumps occurs.
 - An experienced ecologist is present when all excavation work is undertaken in the ECMA or other conservation management areas.

- Dogs are prohibited from all wetland areas before, during or after the creation of the wetlands which have or will have significant wetland wildlife values.
 - Construction and excavation of existing and new wetlands does not take place in the breeding season of birds, from August to December.
 - In the absence of Pegasus Bay subdivision being a cat free or cat curfew subdivision, then a continuous moat or wide water body separating residential housing and the ECMA be created running the entire length of the boundary between any new housing developments and the ECMA. Should a condition of a moat be imposed, the surface water area should be no less than between 4-5 metres wide to successfully deter domestic cats which will traverse into the newly enhanced wetlands.
 - A birdlife management strategy and an animal and plant pest management are established.
 - Only indigenous plants are to be used in all ecological restoration that occurs in the area.
 - Any wetland restoration that takes place be done in a way that creates a habitat that when established has the potential to be suitable for the reintroduction of regionally extinct bird species such as Fernbird, Brown Teal, Buff Weka and New Zealand Dabchick.
 - Impose controls that will ensure that water flow to the Pines and Kairaki Beach settlements is no worse than at present.
 - Impose controls that ensure no additional pollutants or sediments are allowed to enter Salt Water Creek at the Pines and Kairaki.
 - Limit earthworks to an area of 5 hectares at one time.
 - Reduce the amount of groundwater to be taken to fill the lake.
 - Restrict noise from earthworks during the hours of 8am-5pm, Monday to Friday.
 - Compensate existing groundwater users should their wells dry up and/or become polluted.
 - To ensure that the final outflow from the development into the Taranaki Stream has an adequate permanent silt trap.
 - Impose conditions on consent CRC062181 to ensure that groundwater levels are maintained during years of high or low flow.
 - Gives the Waikuku Water Users Group some protection should natural conditions not allow the proposed lake to be created and function as planned.
52. Submitters supporting the applications stated that the proposal was a well conceived and planned development which would have major economic benefits for the region. Submitters also supported the fact that the development would enhance the recreational opportunities for the residents of Pegasus Town and the wider North Canterbury District. Submitters in support of the applications requested that the consents be granted in full with no conditions attached.
53. The CRC issued a Certificate of Compliance for the discharge of dust from the property on 11 March 2006. This requires that there be no objectionable discharge of dust off site.
54. The land use consent application to the WDC was notified on Wednesday 15 February 2006. Six submissions were received within the statutory timeframe, four of which were opposed to the application and wished to be heard, while the other two were in support. The main concerns raised by submitters were:
- The potential effects of exposing large areas of soil.
 - The potential effects of excavation on the water table.

- The potential effects of noise from machinery
- Lack of soil structure information and the potential effects of liquefaction.

3 Summary of Evidence

3.1 *The Case for the Applicant*

55. The applicant's case was co-ordinated by Ms Lauren Semple, Barrister and Solicitor of the legal firm of Anderson Lloyd Cauldwell in Dunedin. She called eight witnesses, four of whom we took as read and asked questions of clarification only.
56. **Ms Semple** provided an overview of the applications and listed who would appear and their relationship to the applications.
57. Ms Semple then went through the main statutory matters that we need to address when considering the applications. The main points covered in summary form included:
- The status of the proposed activities.
 - Precedent effects.
 - Permitted baseline issues concentrating on the point that we should take into account only those effects over and above the controlled activity threshold particularly in relation to the WDC application R 055800.
 - The positive effects of the proposals.
 - Ground water and surface water effects.
 - Geotechnical issues concentrating on liquefaction.
 - Cumulative effects.
 - Section 104, s104B, s104D and s107 of the Act.
 - Part II matters.
 - She provided a copy of and made detailed submissions relating to the certificate of compliance obtained from Environment Canterbury in respect to discharges of the air associated with the construction activities of Pegasus Town. The certificate was obtained on the basis of land disturbance of up to 100ha at any one time.
58. **Mr Graham Levy** is the Technical Director of Beca Infrastructure in Auckland. He has a Masters Degree, is a registered engineer and has 30 years experience in civil engineering focusing on water resources development. His evidence covered stormwater management, the hydrology of the site, water quality of the lake and the discharges from the site, effects on downstream flooding and the operation and management of the systems.

59. Mr Levy compared water quality in the trial lake already excavated by the applicant with that in the inter dune drain, Tutaepatu Lagoon and the shallow groundwater. Groundwater in the location is characterised by elevated levels of metals and nutrients. The trial lake is still in an establishment process, with parameters such as turbidity and clarity improving steadily. Metals and nutrients currently exceed ANZECC guidelines for recreational water quality. Biological processes in the lake will mean some parameters change over time and with seasons.
60. The water level in the lake will be between 1.2 and 1.5m RL, with the target operating level being 1.4m RL. The ECMA is projected to operate at a level of about 1.2m RL, whereas the water level in the inter dune drain is about 1m RL.
61. Mr Levy then described proposed stormwater management on the site. We need not detail that here as we have already described its components briefly in section 2.2.2 above. He emphasised how the design for the different parts of the system will meet the ARC TP 10 standards, and how it will at all times treat fully the first flush rainfall of 18mm, which he said is one third of the two year, 24h storm.
62. Secondary overflows will enter the lake or the ECMA directly in storms with a frequency of <10%. Entry will be via small wetland areas that will be used for flood spreading. The calculated total flood storage on the site, assuming a lake and ECMA levels of 1.4m RL and 1.2m RL, will be increased relative to present conditions for events up to a 0.2% AEP event. The lake will have two adjustable outlets to the ECMA, with culverts that will operate during high lake levels.
63. Mr Levy then discussed likely future water quality in the lake. He said that although clarity was quite good in the trial lake, visits to similar lakes suggest clarity may not be high. Birds will seek to live on the lake, and if they are not kept out they could have significant effects on bacterial loadings, so the water quality may not be suitable for contact recreation for at least parts of the year. He presented a draft lake management plan, which indicated that the future uses for which the lake is suitable will depend upon its water quality.
64. A table was presented that showed projected water quality at the outlet of the ECMA (where it enters the inter dune drain). This showed that there will be minimal contamination as a result of stormwater discharges from the site, and that the quality of the water discharged will be much higher than that previously sampled in the inter dune drain. Some of the figures in this table differed substantially from that in the Hydrology Report provided with the AEE.
65. Finally in his first presentation Mr Levy discussed monitoring and commented on the points raised in submissions and the officer's reports.
66. **Ms Ann Williams**, a senior hydrogeologist with Beca Infrastructure, has a Masters degree along with other postgraduate studies, and 18 years experience in engineering geology and hydrogeology. Her evidence address the hydrogeological issues associated with the development of Pegasus Town.
67. Extensive hydrogeological investigations have been carried out on the site. In simple terms the site comprises the sands and old swamp deposits of the Christchurch formation on the surface. These overlie the gravels of the Springston formation at about 5m depth, and Riccarton gravels at 20 – 40m depth.

68. A series of two dimensional groundwater models of the area have been prepared. They calibrate well with field measurements of groundwater levels. The models are based on levels in the lake and ECMA respectively of 1.4m and 1.2m RL. In summary, the modelling shows:
- Shallow groundwater will be drawn down close to the lake, but drawdown effects rapidly reduce to 0.4m at 200m distance and to 0.1m at 700m. There will be no drawdown at SH 1 to the west.
 - Seepage inflow to the lake is estimated to be about 12l/s on average. About half of this is predicted to be from rainfall infiltration in the Christchurch and Springston formations, and about half from the deeper Riccarton gravels. The work required to compact the sands close to the lake to reduce the risk of liquefaction will have a negligible effect on inflow to the lake.
 - The development of the lake and ECMA will have no effect on water levels in Tutaepatu Lagoon.
69. **Mr David Gardiner**, who is a professional engineer with some 15 years experience, is employed by Beca Infrastructure Limited. He gave evidence on construction management.
70. The applicant proposes to complete bulk earthworks on the site within two years so as to minimise disruption to new house owners in the southwest of the subdivisions. To do so, works will need to be carried out on up to 100ha at one time. These works include stripping of topsoil, excavation of the lake and the ECMA, other works in the ECMA such as vegetation removal and creation of waterways, and construction of building platforms, roads, services and drainage. These works will involve the movement of nearly 2 million cubic metres of sandy soil around the site. The total construction phase is projected to last 4-5 years.
71. Mr Gardiner asserted that managing large areas of earthworks on the site at one time will not be difficult. The site is flat, much of the material excavated will be wet, and large scale earthworks are concentrated towards the centre and east of the site, which is furthest from any residential properties. A range of mitigation measures were proposed, including:
- Limiting the hours of work to “normal construction hours” between Monday and Saturday.
 - Watering exposed surfaces during dry conditions to minimise dust nuisance, and locating stockpiles away from property boundaries.
 - Sediment run off will be towards the east, and much will be towards the lake, which is proposed to be excavated early in 2007. A temporary bund will be constructed along the southern and western boundaries, and sediment control ponds consistent with best practise will be constructed in the ECMA prior to clearing work beginning.
 - A construction management plan will be prepared.
 - Bulk fuel will be stored on one part of the site. Hazardous substances will be stored in accordance with national and WDC regulations. Portable toilets will be used and toilet waste taken off site.

- Protocols will be in place for any discovery of waahi tapu, waahi taonga or urupa.
72. **Mr Timothy McMorran** is a geotechnical engineer with the consultancy firm URS, for whom he has worked for 10 years. He provided evidence on seismic hazards, and particularly the potential for liquefaction on the site. We took his evidence as read and asked questions.
73. Comprehensive geotechnical investigations have been carried out on the site, including 97 cone penetration tests. These tests have allowed the risk of liquefaction on the entire site to be assessed. Similarly they have allowed the risk of lateral spreading near the margins of the lake, as a result of the construction of the lake, to be assessed.
74. This work showed that given adequate compaction of soil and sand during site development, potential settling of buildings in the residential area following a 150 year return earthquake is typically 30-40mm, and is no greater than 100mm (which is considered a useful limit for such settling). Many parts of the existing Christchurch urban area are much more susceptible to liquefaction and settling following a large earthquake than will be Pegasus Town.
75. Liquefaction leading to lateral spreading poses a much greater potential risk on the Pegasus site due to the excavation and filling of the lake and ECMA. Modelling showed unacceptable large lateral displacements, of as much as 1,000mm in a 150 year return period event, close to the lake and the ECMA water features. To mitigate this risk, the Applicant proposes to compact the soil close to the lake using one of three well established geotechnical methods.
76. **Dr Eric van Eynhoven** is an ecologist with three years experience employed by Boffa Miskell Limited. He gave evidence on the restoration and development of the ECMA, and the likely nature of the fauna that will eventually live in and on the lake and ECMA. We read his evidence overnight, and then asked questions.
77. We have already summarised some of what Dr van Eynhoven told us in paragraphs 33-35 above. The additional matters that he raised included:
- Mudfish will be trapped and moved from the ECMA before vegetation removal and excavation begins. The Applicant intends to return these fish to the ECMA once it is fully developed.
 - There will be some adverse effects during construction, such as disturbance to vegetation and discharge of sediment. These effects will be mitigated in so far as reasonably possible.
 - The long term benefits from the enlarged and restored habitat of the ECMA in particular will outweigh these short term construction effects. In particular, he considered the proposal would result in a long term benefit for biodiversity in Canterbury.
 - He expected species such as shortfin eels, inanga, bullies and frogs to inhabit the ECMA.

- There is a high risk of unwanted or pest plants and animals being introduced or becoming established in or on the ECMA and the lake. These include waterfowl such as ducks and geese, and exotic fish such as carp, perch or rudd. Management Plans will be developed to deal with such species.
78. **Mr Te Marino Lenihan** is the Cultural Advisor to Pegasus Town Limited. His role is to facilitate an effective working relationship between Pegasus Town Limited, Te Ngai Tuahuriri Rununga and Te Rununga o Ngai Tahu. He has degrees in Law and Arts. We read his evidence overnight, and then asked questions.
79. Mr Lenihan is a member of the Reuben whanau of Tuahiwi, and a direct descendent of those buried at Kai-a-poi pa (which is about 100m north of the subject land). He gave evidence on the history of the site, key values of tangata whenua and the policies and recommendations of Ngai Tuahuriri and Ngai Tahu. The subject land is within the traditional boundaries of Ngai Tuahuriri who exercise kaitiakitanga on the site.
80. Mr Lenihan detailed how consultation had been undertaken with tangata whenua, and how their concerns had been taken into account during the proposals for the development of Pegasus town and its environs. In particular, he told us that:
- Potential effects on wahi tapu and wahi taonga had been addressed through proposed conditions relating to accidental discovery.
 - The design of the stormwater system mitigates potentially significant effects on cultural values, but ongoing monitoring needs to occur to ensure this.
 - He was satisfied that the proposed conditions of consent would ensure the stormwater system was appropriately maintained.
81. **Dr Daniel Witter** is a consultant archaeologist to Pegasus Town Limited, for whom he had prepared a Section 12 application to the Historic Places Trust (HPT). He provided evidence on the Maori history and archaeology of the site. We read his evidence overnight, and then asked questions.
82. Earlier work undertaken on the site, along with Dr Witter's studies, had shown it to be arguably the most significant indigenous cultural area in Canterbury. Some of these values will be protected in the greenstone working Houhoupounmamu site, otherwise called the Western Conservation Management Area, which is beyond the scope of the current applications. It, along with the Mudfish Conservation Management Area and the ECMA will help preserve archaeological sites on the subject land.
83. A mitigation operational plan has been prepared. Dr Witter detailed its provisions for the different areas on the site. He noted that the WDC District Plan rules, in addition to those from the HPT, would result in a shutdown of equipment and activities on part of the site in the event of an accidental discovery of artefacts. He considered that the "extensive" mitigation programme agreed to by the Applicant, along with the conditions in the HPT authority and those of the District Plan rules would mean the effects of the proposed development on archaeological values is satisfactory.
84. The next witness for the applicant was **Mr Marc Bretherton**, a senior consultant with Mitchell Partnerships. He gave a broad overview of the applications and their effects, and addressed planning issues.

85. Mr Bretherton was in general agreement with the assessments of the status of the various activities provided by the officers. He noted that the application to the WDC to undertake earthworks on an area of greater than 5ha at one time was a non-complying activity. Almost all the applications to CRC are discretionary, apart clearly from CRC062174, which is to excavate for the lake and wetlands, and which is non-complying.
86. He agreed with Mr Brough that the activity status of CRC062181, to “take” and use water in the lake and ECMA is problematic. He agreed with Mr Brough that the filling of the lake, once excavated, is a natural process rather than an activity in its own right, and does not involve actively taking water. In discussion with us he reinforced his view that if we are to be conservative it would be most appropriate to consider this “take” as a non-complying activity under Rule WQN 23 of the PNRRP.¹
87. There has been extensive consultation with WDC utilities staff following their detailed submission on the applications to CRC. Mr Young would speak to us on this.
88. Mr Bretherton then outlined his views on the matters we have to consider under s 104. He concluded that while there will be short term construction effects, the mitigation measures proposed will minimise these.
89. He next outlined relevant objectives and policies from regional and district planning documents, and concluded that the proposal is not contrary to the relevant policy matters in that policy statement and plans. In his view the effects of the activities which are or may be non-complying are minor, and generally in accordance with objectives and policies in the district and regional plans. Accordingly, he concluded that the applications passed both the threshold tests enabling the non-complying activities to be granted under s 104 D of the Act.
90. Finally we heard again from **Mr Levy**, who proposed consent conditions for our consideration. These were based on the conditions proposed by Mr Brough in his s 42A report, as modified by the applicant. In particular, some of the amended conditions put forward by Mr Levy reflected the discussions between the applicant and the engineering staff of the WDC as a submitter.

3.2 The Submitters

91. Nine submitters representing seven parties appeared at the hearing. Mr William Wilson appeared on behalf of two groups of submitters, and there were four submitters appearing on behalf of the Te Kohaka o Tuahitara Trust.

3.2.1 Mrs Jo Kane

92. Mrs Kane and her husband Murray have lived at Waikuku Beach for 12 years. They moved there because they saw it as a “special place” with high natural values, and particularly the role the river and the sea play in the surrounding environment. There are about 800 residents in the community, most of whom live there permanently.
93. Mrs Kane is the deputy Mayor of the Waimakariri District and a trustee of Te Kohaka o Tuahitara Trust, whose submission she supported. She emphasised however that she was appearing before us in her own right as a resident and ratepayer of the district.

¹ This is a matter that we return to in some detail later in this decision.

94. Mrs Kane highlight a media statement made by Mr Robertson, the chief executive of Infinity Group Holdings Limited who are developing Pegasus, in which he stated in effect *“that the granting of resource consents was already deemed to happen unless we do something stupid”*. She said the integrity of the process is paramount and such a statement was *“arrogant”*. Without commenting on the accuracy or otherwise of Mrs Kane's recollection of Mr Robertson's media statement we can assure her, and for that matter all other submitters, that the applications before us have received a very thorough and complete assessment by the reporting officers for the two Councils and of course very careful consideration by ourselves as Commissioners.
95. Although Mrs Kane has had (and we understood still has) many concerns about the development of Pegasus, the primary concern she raised with us about the present applications is the effect that their granting may have on downstream water quality, and, particularly, water quantity. She was particularly concerned that flooding near Waikuku Beach may be exacerbated during extreme weather events as a result of the development of Pegasus town, along with other recent developments in the catchment of the Taranaki Stream.
96. We were provided with a series of photographs by Mrs Kane of recent historic flood events that have affected Waikuku Beach and its environs. She noted that during times of high flows in the Ashley River the floodgates that allow drainage from the Taranaki Stream can remain closed, and this can exacerbate local flooding. She sought assurances that the development of Pegasus would not cause any increase in flood risk downstream. She highlighted Policy 8.2.4.1 in the WDC District Plan, which requires that the effects of activities that redirect or exacerbate floodwaters be avoided, remedied or mitigated.
97. Mrs Kane sought the application to discharge stormwater from the ECMA be declined. If it were to be granted, she sought it be with conditions requiring comprehensive water quality monitoring.

3.2.2 Mr Don Young, Waimakariri District Council

98. Mr Young, who is the Manager of Utilities and Roading at the WDC, is a professional engineer with 20 years experience, 11 years of which have been as a senior manager in local government.
99. WDC had made a comprehensive submission to the applications to the CRC. The matters raised were made in the context of the community assets at Pegasus, particularly the stormwater disposal system, the lake and the ECMA, eventually being vested in the WDC (although the Council had yet to formally consider ownership of the various assets). Vesting in the WDC was likely to occur in stages, and Mr Young wanted each consent to stand alone so that the more simple assets (such as the stormwater swales) can be vested first.
100. Mr Young told us that a series of meetings between representatives of the Applicant and WDC had resolved many of the matters raised in the WDC submission. These had also been largely attended by Mr Blay and Mr Brough, the two reporting officers. Following these meetings the WDC now supported the applications, subject to four assurances from the Applicant in relation to the detail of the stormwater management system. WDC also supported the detailed consent conditions proposed by the Applicant, but on the proviso that they should be consulted on any substantive

changes to the proposed management plans that would need to be approved by the CRC.

101. In relation to the specific concerns of the WDC Mr Young said:
- Sufficient assurances had now been provided regarding the performance of the swales and the sand filters (as part of the stormwater management system) to warrant WDC's conditional withdrawal of their opposition to these applications.
 - Similarly sufficient assurance had now been provided in relation to the performance of the lake and the ECMA, and impacts on the downstream environment, to warrant the WDC withdrawing their opposition to these applications.
102. As we said to Mr Young at the hearing we found his approach, and that of the WDC as the authority in whom the Pegasus community assets will eventually be vested, very constructive. We thank him for that.

3.2.3 Mr Brian and Mrs Anne Stokes

103. Mr Stokes gave evidence on behalf of himself and his wife. Mr Stokes, who holds a B.Ag.Com degree, has lived at 1333 Main North Road all his life. He leases grazing land from the Te Kohaka o Tuhaitara Trust downstream of Pegasus.
104. Mr Stokes had three main concerns about the applications to the CRC that are before us:
- He sought assurances that the "take" of groundwater would not affect domestic and irrigation wells in the vicinity, and that it would not be a take from deeper groundwater.
 - The development could exacerbate downstream flooding on the land that he leases, and in Waikuku Beach. Flow monitoring needed to take place, and Pegasus should contribute to downstream flood mitigation works (such as maintaining the channel capacity of the lower Taranaki Stream, and the floodgate to the Ashley River).
 - Canada geese are already a problem in the area, and PTL must work very actively to ensure this problem is not made worse.

3.2.4 Mr Gerald Sandrey

105. Mr Sandrey is a resident of Swannanoa in the Waimakariri District. He raised concerns about the disposal of stormwater from the proposed Pegasus development, and the risk posed by liquefaction hazards on the site.

3.2.5 Mr William Wilson on behalf of the Waikuku Water Users Group

106. Mr Wilson spoke on behalf of the Waikuku Water Users Group (WWUG). The Group has 15 members who take water from the Waikuku and Taranaki Streams and their tributaries, and live largely to the north and west of Pegasus. Group members were provided a site visit which had satisfied some of their concerns, but those that remained were:

- Members of the WWUG were “*very nervous*” about the effects of the “take” of groundwater for the lake and ECMA having an adverse effects on the long term equilibrium between surface water and groundwater in the area. This could affect existing bores of Group members. Mr Wilson sought that the amount of water to be taken be put on a “*formal basis*”, that only passive groundwater drainage is used to fill the lake, and that nearby off-site bores be monitored to ensure they were not adversely affected.
- The Group has concerns about the effects of the discharge on downstream flooding during high rainfall events, and this discharge needed to be controlled.
- Like Mr Stokes the Group were concerned about the possibility of greater numbers of Canada geese being attracted to the area.

3.2.6 Mr William Wilson on behalf of Waikuku/Rakahuri River and Coastcare Group

107. Mr Wilson also presented the submission on behalf of the Waikuku/Rakahuri River and Coastcare Group. The Group, which was formed in 2000, aims *to protect the environment in the Ashley/Rakahuri estuary, rives and tributaries from SH 1 to the coast and maintain and enhance its natural values for the benefit of enjoyment of present and future users*. It has four co-ordinators for different areas, and undertakes a wide range of activities to enhance the area.
108. The Group has identified the area in the lower reaches of the Taranaki Stream as a very high priority project for enhancement, as it is a recognised wetland and inanga spawning area. Significant work has already been carried out, with some support from CRC who have provided grant money.
109. The Group is concerned that the quality and quantity of the storm water discharges from Pegasus could affect the values they have been seeking to restore in the lower Taranaki Stream. They sought conditions to protect water quality, and also confirmation of a verbal offer made by Infinity Group Holdings Limited that they would contribute \$40,000 worth of plants towards the restoration efforts of the Group.

3.2.7 Te Kohaka o Tuhaitara Trust

110. The Trust is responsible for the management of the reserve land between Pines Beach and Waikuku Beach. This covers some 550 ha that stretches along the coast some 10.5km, both to the north and south of Pegasus. The Trust comprises six trustees, three appointed by Ngai Tahu and three appointed by WDC. We heard from two of those trustees, Mr Jolliffe and Dr Scott, and other Ngai Tahu trustees were also present to help answer questions. We also heard from two witnesses from the National Institute of Water and Atmospheric Research (NIWA).

Mr Alan Jolliffe

111. Mr Jolliffe is the deputy chairman of the Trust. He has professional qualifications in parks and recreation management and has held a senior management position at WDC. He presently works for the Historic Places Trust, and is also chairman of the Canterbury Aoraki Conservation Board.

112. The land managed by the Trust is in three main parcels. These are the Waikuku Beach reserves and the Tuhaitara Coastal Reserve, which includes Tutaepatu Lagoon. The lagoon block is fully owned by Te Runanga o Ngai Tahu, and comprises some 49ha, of which 15-20 ha are open water. Historically the lagoon was a rich and important source of mahinga kai for the residents of Kaiapoi Pa, and it includes some urupa.
113. The lagoon was set aside as a wildlife management reserve in 1973. The Ngai Tahu settlement deed of 1998 vested the lagoon in Ngai Tahu, who hold the title in fee simple, and established the Trust. The associated vesting act required the Trust to prepare a management plan, pursuant to s 41 of the Reserves Act, for the area under its control.
114. Mr Jolliffe sought that we acknowledge the significance of the reserve and Tutaepatu Lagoon, particularly in light of actions by Government, WDC and Ngai Tahu. The Trust's main concerns relate to water quantity and quality.

Dr John Scott

115. Dr Scott, who holds a doctorate in soil science, is another trustee of Te Kohaka o Tuhaitara Trust. He spoke particularly of the coastal reserve management plan prepared by the Trust, of which we were provided a copy dated April 2006. The plan only has to have some minor corrections made before being sent to the Minister of Conservation for his final approval. He listed the relevant objectives and policies from the draft management plan. Funding of \$250,000 was provided as part of the settlement, and the WDC set aside \$50,000 for the preparation of the management plan.
116. The management plan seeks to restore and preserve the values of the coastal reserves, particularly Tutaepatu Lagoon, and so to give effect to Kaitiakitanga. One possibility for doing so is to develop "hubs" and "corridors" to give priority to smaller areas and then develop these into more wide areas of the reserve. The successful management of the reserve relies upon the shallow groundwater that has travelled from the inland plains.

Mr Maurice Duncan

117. Mr Duncan is a senior surface water hydrologist with NIWA. He has a Master of Agricultural Science, and has 38 years experience. In answer to a question he said he has had very little experience in the stormwater management, or the treatment of stormwater.
118. Mr Duncan questioned some of the amended figures for stormwater treatment efficiency put forward by Mr Levy. He said it was unclear whether treatment included the lake and the ECMA, and suggested the discharge from the ECMA to the Trust land could breach ANZECC guidelines. He believed that some of the assumptions about treatment efficiency put forward by the applicant were incorrect, and considered that application CRC 062178 to discharge stormwater from the ECMA should be declined, or alternatively that extra treatment should be provided for in the ECMA.
119. The removal of pine forest could increase the rate of discharge of groundwater to the lake. Mr Duncan noted that this would be beneficial for the quality of water discharged from the ECMA to the Trust's land. He advocated for greater monitoring of the water quality of this discharge, and was pleased that Mr Levy had proposed

this. He also noted that if the outlet to the ECMA is set at a level of 1.2m RL, then much of the discharge from the ECMA would be by seepage rather than direct discharge.

Dr Catherine Chague-Goff

120. Dr Chague-Goff, who is highly qualified in earth sciences, has worked for NIWA for six years. She is an environmental geochemist with expertise in wetland geochemistry and assessing the effects of land use changes on sediment and water quality. In response to questions Dr Chague-Goff confirmed that she does not have expertise in stormwater treatment.
121. Like Mr Duncan she questioned the new values presented by Mr Levy for the effectiveness of stormwater treatment and the quality of water discharged from the ECMA. She considered this discharge may exceed ANZECC trigger values for ecosystem health and aquaculture values, particularly for parameters such as the nutrients nitrate and phosphate, and suspended sediment. While noting that existing water quality in the Tutaepatu lagoon and the inter dune drain are low, Dr Chague-Goff asserted this could be because the Woodend STP has been known to leak. We had asked Mr Duncan, who made a similar assertion if he had any evidence for this, which he did not.
122. Dr Chague-Goff told us that she had spoken to another NIWA scientist, Dr Chris Tanner, who she said is an expert in treatment wetlands. She said that Dr Tanner had suggested that the ECMA could be reconfigured to provide additional treatment.

3.3 The Officers' Reports

123. We took the officers' reports as read, and asked Mr Blay, Mr Brough and Ms Lough whether there were any matters that they wanted to expand on, or comment on or revise in light of the evidence presented to the hearing.

3.3.1 Mr Garry Blay

124. Mr Blay spoke briefly to his officer's report. He concentrated on the evidence and proposed conditions raised by Mr Gardiner in relation to the land use application to WDC. The main points he raised were:
- He considered that the earthworks activity was not contrary to the objectives and policies of the OWDP.
 - WDC would be comfortable with to up to 50ha of earthworks on the site occurring at one time provided several criteria could be met. These include the establishment and maintenance of effective dust control and effective sediment control, and no there being no noise issues. He said more than 50ha could be agreed to if good performance is demonstrated.
 - In relation to dust he considered the land use consent should specify that there be no objectionable dust off site, as this would be consistent with the certificate of compliance issued by the CRC.
 - He had some concern about the method for preventing lateral spreading around the lake has not been specified at this time, and noted this would need to be put in

place before development occurred within 200 -300m of lake. He considered the Applicant should provide more detail about which method would be used in their right of reply. Mr Blay also sought some clarification as to whether shingle would be bought on the site to line the margin of the lake, as there are potential traffic issues associated with transporting gravel.

- He believed hours of work could be specified in the construction management plan.

125. We also noted that attached to Mr Blay's report was a supplementary report by Mr Ian McCahon of Geotech Consulting Limited on liquefaction hazards. Mr McCahon, who has 30 years experience in civil and geotechnical engineering, had been asked by WDC to look at six specific issues. In broad terms he concluded that the Applicant had comprehensively addressed issues relating to liquefaction and lateral spreading, and that the measures they proposed to mitigate these risks would be satisfactory.

3.3.2 Mr Andrew Brough and Ms Hilary Lough

126. Mr Brough spoke to his comprehensive officer's report, which had been prepared to cover the applications to the CRC. We then heard from Ms Lough, who had prepared a supplementary report on surface and groundwater interactions in the Pegasus environs, and finally from Mr Brough again.

127. Mr Brough initially raised the following matters:

- He noted that while he had received revised conditions from the Applicant on 18 May, but had not seen the further revisions proposed by the Applicant until during the hearing.
- He had raised the issue in his report as to whether the Applicant might want to give consideration to proprietary systems to treat stormwater. Mr Levy had commented in response that he was concerned about maintenance costs. Mr Brough noted that there are some proprietary systems that are similar efficiency as sand filters to meet ARC TP 10 standards, but he was confident however that the systems proposed would meet those standards.
- In regard to treatment of the "first flush, he noted the stormwater treatment systems proposed will contain 18mm without infiltration, so more than the first 18mm will be treated if you allow for infiltration. Rainfall events of greater than 25mm make up less than 9% of the rainfall received locally, so treating the first 18m plus infiltration will mean that 85%+ of all rainfall is treated. As this is a high level of treatment, he was comfortable that treating the first 18+mm of rainfall is appropriate for Pegasus. He was also comfortable with stormwater from the business district being discharged directly to the lake in a larger than 10% AEP event, as that stormwater would be substantially free of contaminants.
- The description of the receiving environment in his report was largely from the AEE provided by the Applicant. Mr Brough noted that water quality in the lake and ECMA may not meet ecosystem health guidelines, but he did not have any significant concern about this. He believed the Applicant's suggested approach of monitoring to find what can be achieved in regard to water quality was appropriate. One could then use the trigger values in ANZECC 2000 to indicate where there might be an issue, and if certain parameters were above these regularly then the uses the waters could be put to would need to be reclassified.

- Mr Brough had some concerns about the effects on downstream flooding in a 1% AEP or larger event. The Applicant had said flows downstream will not increase flow in a 1% AEP event, but Mr Brough noted that in such a large storm other things might be happening, such a breakout of the Ashley River and/or very high flows in the Taranaki Stream. Also water will be released for a longer duration and may increase the duration of flooding on the land Mr Stokes leases, and his could perhaps be an effect that is that more than minor.
- One of the options suggested by the applicant in response to concerns raised by the WDC about leaves clogging up parts of the stormwater treatment system was potentially very effective and has the potential to reduce maintenance required.
- The effectiveness of the stormwater system will rely on it being well maintained, with the infiltration areas regularly rejuvenated. Mr Brough did see maintenance as being very onerous, noting that it would likely be at least 10 and more likely 20 years before the infiltration swales will need to be excavated and the topsoil replaced. He believed this could readily be managed over the life of the consent.

128. We next heard from Ms Lough, who in relation to her report raised the following key issues:

- Her evaluation and conclusions were based on levels provided in the AEE with lake being at 1.4m RL, and the ECMA at 1.2m RL. She noted that other levels that had not been assessed, and was strongly of the view that those are the appropriate levels to set in any consents granted. She gave the example that if the lake is significantly higher than 1.4m then mounding of groundwater could occur, and higher local groundwater levels could inundate components of the stormwater treatment system. Similarly, setting a different level for the ECMA will affect local groundwater/surface water interactions. Once more is known about the hydraulic interactions between surface and groundwater in the area, a variation could be sought in due course if that was desired or if unexpected problems arose.
- Ms Lough expected the effects of land subsidence and groundwater mounding to be minor. She agreed with Ms Williams that the effects of removing the pine trees towards the west of the site would not be significant, and she did not consider it likely that extra drainage will be required.
- Groundwater models always have some uncertainty, but in her view the model used by the Applicant is appropriate. Ms Lough noted that Ms Williams had carried out a sensitivity analysis, and found because lake and ECMA levels will be controlled there will only be small changes in groundwater levels. This is to be expected because of shallow hydraulic gradient.
- She agreed with the Applicant that there would be some uncertainty about seepage levels to the lake, but noted this will depend in part on the level set for the lake and local groundwater levels. She considered the effects of the seepage to be no more than minor based on the levels proposed in the AEE of 1.4 and 1.2m RL for the lake and ECMA respectively. Evaporative losses from lake were estimated to be 6-8 litres per second, which she did not consider significant in terms of the overall groundwater/surface water interaction.

129. Mr Brough then raised the following further issues:
- It is important to note that there are positive effects from the proposed development, particularly from the creation of the ECMA.
 - Mr Young has said that WDC have only given conditional approval to take over the management of the Pegasus stormwater and water body assets. Mr Brough noted that certainty is needed for the 35y duration of the possible consents. He also noted that each consent will have its own conditions and be separate, and that this will meet one of Mr Young's concerns.
 - A duration of 5 – 15 years for the construction consents is satisfactory. The swales will need to be protected during site construction, and experience around Christchurch had shown this can be difficult to enforce. This matter can be addressed as part of the engineering approvals.
 - He has not seen any breakdown of the revised Table D presented by Mr Levy, and as those figures varied substantially from those in the AEE more detail as to how they were derived is necessary.
 - Mr Brough has not seen the detailed design of the ECMA but agreed that with a bit of engineering it could provide for additional wetland treatment of stormwater.
130. Mr Brough then commented on the conditions now proposed by the Applicant. We need not detail that here as we come back to these matters later in this decision.

3.4 The Applicants' Right of Reply

131. The applicant asked that their right of reply be given in writing, a request we agreed to. In that right of reply Ms Semple canvassed a wide range of the matters that were discussed at the hearing, and others that we asked for further information on. We need not detail her right of reply here, as we discuss the matters raised in our evaluation of the issues raised below. We found her reply to be both focused and very helpful, and we are grateful for that.

4 Evaluation

4.1 Status of the Applications

132. As the applications were lodged in October 2005 our evaluation is based on the criteria in the Act as amended by the Resource Management Amendment Act 2005.
133. There was no disagreement between the applicant and the reporting officers as to the status of most of the applications before us. These are as follows:
- The application to the WDC is for a non-complying activity as it involves clearing more than 5 ha at any one time
 - The applications to the CRC are generally for discretionary activities. The exceptions are those for CRC 062168 to clear vegetation and disturb soil, which is a restricted discretionary activity, and the application to excavate for the lake and wetlands (CRC 062174) which is non-complying.

134. The status of application CRC 062181 is to take groundwater is more problematic. We think that some form of “take” consent is necessary, largely because we believe that it is not possible to use groundwater that has not been taken. The “take” however is entirely passive, occurring as a direct result of excavating the lake and the ECMA. Predominantly shallow groundwater will flow into these excavated water bodies and gradually fill them.
135. Given this, we have three choices as to how the application to take groundwater could be assessed:
- As an application for a under Rule WQN 19 of the PNRRP, which is for a take of water from a groundwater allocation zone. Although Rule 19 is for a restricted discretionary activity, the proposed activity cannot meet standards 2-4 inclusive, and accordingly must be treated as an application for a **non-complying activity**. This is the option preferred by the Applicant in Ms Semple’s right of reply.
 - As an application for a **non-complying activity** under Rule WQN 23, which is a default rule for applications to take groundwater from “a bore or borefields” that do not meet one of Rules WQN 13 -22 inclusive. This is an option advocated by Mr Bretherton in his evidence. Mr Brough considered the application could be considered under either Rule WQN 19 or WQN 23.
 - As an **innominate activity**, in which case the application would be treated as one for a discretionary activity.
136. The options noted above demonstrate the difficulty of assessing the status of this application. The approach we have taken seeks to give the words in the PNRRP their plain ordinary meaning. At the same time we have endeavoured to consider the activity simply as it is, without imposing any artificial considerations so as to make the activity conform with Rules in the PNRRP.
137. Applying this approach we determined that Rule 19 was not the best option. This is because we consider it applies more to the circumstance of extraction of water by a bore rather than excavation. Using this rule would mean that we consider the excavation proposed here is a bore, or that alternatively we do not apply some of the standards of the Rule.
138. We are more comfortable with the approach set out by Mr Brough in paragraphs 107-118 of his s42A Report. Because the fit between the words in this Rule and the proposed activity are in our view more appropriate, we have decided to determine the application as a non-complying activity under Rule WQN23. We see this Rule as a default rule for applications to take groundwater.

4.2 Matters We Must Consider

139. We are required to have regard to the matters listed in s104, s104B and s104D of the RMA. We may grant or refuse the consent and if granted may impose conditions under s108. However, we are limited in that we can only grant consent for a non-complying activity if we are satisfied that either:
- (a) the adverse effects on the environment (other than any effect to which s104(3)(b) applies, which will be minor; or

- (b) the application is for an activity which will not be contrary to the objectives and policies of the relevant plan or plans.
140. We think three of the applications before us are for non-complying activities. These are applications CRC 062174 to excavate for the lake and wetlands CRC 062181 to take groundwater and the application to WDC to undertake earthworks exceeding 5ha in an area at any one time under number RC 055800.
141. For non-complying activities, even where one of the threshold tests in s104D(1) is met, we still retain an overall discretion as to whether to grant the application. That discretion is to be exercised having regard to the criteria set out in s104. In that respect, and subject to Part II of the Act which contains the Act's purpose and principles we are able to have regard to:
- any actual and potential effects on the environment of allowing the activity;
 - any relevant provision of a proposed plan; and
 - any other matter the consent authority considers relevant and reasonably necessary to determine the application.
142. We also note that under s 104(2) we may disregard effects permitted by the relevant regional and district plans. The OWDP in Chapter 18, Policy 18.1.1.11 specifically provides for the development of a new town at Pegasus subject to a range of listed principles that govern that development. Again within the subdivision chapter Rule 32.1.1.39 subparagraphs (a)-(k) of the OWDP provides for a range of quite significant earthworks which are to be completed before a resource consent for subdivision within the Residential 6, 6A and Business 1 zones at Pegasus is approved. The undertaking of the works is linked back to the number of residential allotments within the subdivision. Those works involve substantial earthworks relating to the construction for new waterways, ponds and the development of a lake at least 13ha among other things. This is the general backdrop of the plan. However, the OWDP at Rule 31.22.1.7 provides that any earthworks associated with the subdivision and development of land within the Residential 6 and 6A zones and Pegasus Rural Zone are limited to an area being stripped of topsoil at any one time to a maximum of 5ha. This discrete provision then sets the particular permitted baseline for the earthworks activity. Rule 31.22.1.7 has as its focus the mitigation of a dust nuisance.
143. In that regard the applicant also pointed to the Certificate of Compliance granted to it by the Canterbury Regional Council pursuant to s139 of the RMA. That Certificate, among other things, confirms that the activity, being a discharge of dust associated with construction activities at Pegasus Town, complies with Rule AQL38 of the PNRRP Chapter 3. Rule AQL38 refers to discharges from unsealed or unconsolidated surfaces on industrial or trade premises and construction sites. In particular Condition 1 of that Rule is included with the purpose of controlling potential adverse effects on neighbouring properties caused by wind blown dust emissions. The objective is to ensure that dust emissions from sites do not cause nuisance effects. The existence of this Certificate of Compliance forms part of the permitted baseline. In essence however the Certificate of Compliance while it provides for discharge to air of dust requires that dispersal or deposition of particles shall not cause an objectionable or offensive effect beyond the boundary of the property where the discharge originates.
144. There are no national policy statements relevant to the present applications, nor do the provisions of the National Coastal Policy Statement apply.

4.3 Actual and Potential Effects

145. While s 104(1) requires that we consider the actual and potential effects of the applications before us, we think this is best done in the context of the issues raised in the applications, submissions and officer's reports.

4.3.1 Extent of Land Clearance

146. Mr David Gardiner, an experienced professional engineer, was of the clear view that managing large areas of earthworks on the site at any one time would not be difficult. The applicant proposes to complete bulk earthworks within a very short time frame of two years. The timeframe has been chosen so as to minimise disruption to new house owners in the south west of the division. We recognise the benefits in that approach. The main reasons advanced by Mr Gardiner to support his view were that the site is flat, and much of the material excavated will be wet. The site itself is of very significant size and the large scale earthworks are concentrated towards the centre and east of the site which is the furthest position away from any residential properties.
147. Mitigation measures including watering exposed surfaces during dry conditions and locating stock piles away from property boundaries. A construction management plan was also suggested.
148. We did note from our own site inspection, which occurred after substantial areas had been cleared of vegetation and the soil surface was exposed that the surface materials at least had a high proportion of sand. This was supported by evidence presented by the applicant. As such, sand compared to other surface materials such as fine ground clays was less likely, particularly when wet, to cause a dust nuisance.
149. The submitters within their written submissions raised concerns relating to potential effects of exposing large areas of soil and potential effects of noise from machinery. However, those submitters that presented materials to us at the hearing did not add to the concerns as expressed in the written submissions.
150. Mr Blay in his s42A report having regard to the mitigation measures proposed, coupled with the overall area of the site, considered that there would be adequate dust mitigation measures available. He concluded that the overall adverse effects of dust are likely to be no more than minor.
151. Attention then focused on what was an appropriate area over which the works should be undertaken. The applicant sought an area of 100ha which could be worked at any one time. Mr Blay for his part took a more cautious approach and proposed that the maximum area subject to earthworks at any time should not exceed 50ha. Mr Blay suggested the 50ha cap because he wanted the certainty that the applicant's proposed mitigation measures would ensure that no dust nuisance arose beyond the boundary. In conjunction with the cap he suggested a review clause which would enable extension of the 50ha limited provided that dust, sediment and noise issues did not arise.
152. In its reply the applicant reiterated that it was confident that it could undertake up to 100ha of site works within the 285ha site without creating adverse effects either off-site or for the initial Pegasus Town residents.

153. We have formed the view that 100ha of site works is a very large site to manage at one time. Notwithstanding the mitigation measures proposed we do have a level of reservation as to whether or not the applicant's confidence is well founded. In this regard we note that different parts of the sites may be the subject to earthworks at the same time. Accordingly there could be a real demand on the plant and equipment that is to provide dust mitigation. To that extent we favour the approach suggested by Mr Blay. We do note that the applicant in its reply has also signalled that it is comfortable with that approach.
154. Accordingly in assessing effects we reach the conclusion that we are satisfied that effects arising from earthworks on a 50ha site can be properly mitigated with the result that the effects will be no more than minor. However, if we are wrong in this assessment we do think that the applicant should have the flexibility of being able to demonstrate through its work practices that an area in excess of 50ha is appropriate. We have endeavoured in the conditions which follow to both address the issue and provide that flexibility.

4.3.2 Liquefaction and Lateral Spreading

155. There were two main effects that could potentially occur following a major earthquake. The first is whether there is a risk of liquefaction under the developed subdivision leading to significant subsidence and consequent major damage to buildings and community assets. The second is whether the risk of lateral spreading (i.e. lateral movement of substrate towards the lake) can be adequately mitigated.
156. On these matters we heard from Mr McMorran on behalf of the Applicant, and the AEE was peer reviewed by Mr McCahon on behalf of the WDC. Essentially Mr McMorran said that with the soil being compacted, subsidence on properties following a major earthquake would be about 30-40mm, which is acceptable, and that the threat of lateral spreading could be overcome by substantial compaction of soils around the lake. Mr McCahon was in broad agreement with these conclusions. We accept the evidence of these experts.
157. One matter that we have some concern about is how the compaction of soils around the lake may affect early residents of the subdivision. Three methods are being considered, and at least one, dynamic compaction, is potentially disruptive as it involves repeatedly dropping large weights to compact sediment. We considered whether it was necessary to impose conditions on the timing of such possible works, but we decided this could be addressed through the construction management plan.

4.3.3 Is the Stormwater Treatment Proposed Satisfactory?

158. The Applicant has proposed comprehensive stormwater treatment on the Pegasus Town site to meet ARC TP 10 standards. These standards are very widely used and have been adopted as a Code of Practice by WDC. All the systems proposed involve treatment via ground soakage, which is what is required under the provisions of the District Plan. We have already described the components of the stormwater treatment system in paragraphs ? above.
159. Mr Levy provided a comprehensive assessment of the proposed stormwater treatment system for the Applicant, and this was peer reviewed by Mr Brough, one of the reporting officers for the CRC. While Mr Brough made some suggestions about alternative methods of treating stormwater to meet TP 10 standards, he agreed that the treatment systems proposed by the Applicant were appropriate and would treat at

least the first 18mm of rainfall to a high standard. While there will be some direct run-off to the lake from the business district in large storm events, this stormwater will by then be very dilute. We accept the advice of these experts.

160. On behalf of the WDC Mr Young told us that the stormwater treatment systems proposed by the Applicant would meet the Council's Code of Practice. He also said sufficient assurances had now been provided regarding the performance of the swales and the sand filters to warrant WDC's conditional withdrawal of their opposition to the applications to discharge stormwater.
161. Mr Duncan, who appeared as a witness for the Te Kohaka o Tuhaitara Trust, questioned elements of the design of the stormwater system, and said it would not be effective and the application to discharge stormwater should be declined. By his own admission Mr Duncan has little expertise in stormwater treatment. We consider his evidence raised no matters of substance that leads us to question the expert advice provided by Mr Levy and Mr Brough.
162. Extensive discussions between the Applicant and the WDC (in its role as a submitter to the applications to the CRC) have resulted in substantial agreement about the detailed design of components of the stormwater system, and how that can be maintained. We need not canvas those matters here as they can be dealt with during the details of the engineering approval stages. Rather our role is to determine whether the treatment system proposed will treat stormwater to a sufficiently high standard such that the effects of the discharges on the environment are avoided or mitigated.
163. We are satisfied that this is the case. The Applicant has proposed a comprehensive "treatment train" for the various discharges of stormwater from Pegasus Town. It will meet ARC TP 10 standards, which in our view are appropriate for an environment such as this.
164. In saying this we observe that care will need to be taken to ensure that roadside infiltration swales are not unduly compacted by heavy vehicles entering building sites, and, somewhat obviously, the "community owned" components of the system will have to be well maintained.

4.3.4 Future Management of the Assets

165. We have already detailed Mr Young's helpful submission. He asked that we do two main things – that the consents be separate from one another so the assets can be taken over by the WDC progressively, and that the WDC be consulted about management plans required to be prepared for the CRC.
166. We have provided for both these requests in our decisions (make sure re second point)

4.3.5 Inflows to the Lake, and the Take and Use of Groundwater

167. Two of the most problematic issues that we had to consider for these applications was the planning status of the application to take and use groundwater, and, provided we think a "take" consent is necessary, for what volume of water. We have already discussed the first issue at paragraphs 134-138.

168. At the request of the CRC application CRC 062181 was notified as a take for up to 750 litres per second. This was calculated as the very maximum groundwater volume that could discharge to the lake following a major storm event. More realistically, according to the Applicant the excavation of the lake will initially lead to a “take” of around 100 l/s as the lake fills with shallow groundwater (this has been calculated from the filling rate of the trial lake), and that once the lake is full the rate of “take” will decline to an estimated 10-20 l/s.
169. We were somewhat uncertain of the best approach here. Our difficulty is that if we grant the application for the up to 750 l/s sought, this does not accurately reflect what is happening except in extreme situations. We do not want to see a situation occurring where other potential users of groundwater in the area are denied access to water because of a “take” granted Pegasus for a situation that will occur very rarely. What we have decided to do is insert an advice note in the consent granted that states the actual take will be far less than is granted as a maximum, while noting that the actual take cannot accurately be measured due to factors such as evaporation.

4.3.6 Effects on Groundwater Levels and Other Users

170. The “take of groundwater to fill the lake and ECMA, and the ongoing “take” could have adverse effects on groundwater levels and so affect the reliability of supply for nearby users. Submitters such as Mr Stokes and the Waikuku Water Users Group were particularly concerned about this potential effect. The “take” could also potentially affect water levels in Tutaepatu Lagoon, with adverse effects on its associated conservation values. Logging of the existing exotic forest to the west of the Pegasus site could also affect groundwater levels.
171. These potential effects were discussed in the evidence of Ms Williams, and were peer reviewed by Ms Lough on behalf of the CRC.
172. The modelling undertaken by Ms Williams was based on levels in the lake and ECMA respectively of 1.4m and 1.2m RL. Infiltration will be from both shallow, rainfall fed groundwater, and from deeper gravels. Shallow groundwater will be drawn down close to the lake, but drawdown effects rapidly reduce to 0.4m at 200m distance and to 0.1m at 700m and there will be no drawdown at SH 1 to the west. The logging of the forest will have no significant effect on groundwater levels. As the lake and ECMA become full, a new equilibrium will develop between local shallow groundwater and the Pegasus water bodies.
173. Ms Lough told us the model used by Ms Williams was appropriate, and she agreed with Ms Williams that the effects of the groundwater take on other users would be no more than minor given all those users are beyond the zone in which drawdown is expected. She noted that the quantity and distribution of rainfall recharge of shallow groundwater will not change, and she did not expect there to be any adverse effects on water levels in surrounding water bodies.
174. Ms Lough however did warn us that the modelling undertaken is based upon the levels of 1.4m and 1.2m RL in the lake and the ECMA, and the model may not be accurate if these levels are substantially varied. By way of example, a significant higher lake level could lead to “mounding”, which could inundate components of the stormwater treatment system. She believed that if a significant change to levels was to be sought, that could be by way of a future variation to the consent once the lake and ECMA have been constructed and monitored.

175. We agree with the expert evidence of Ms Williams and Ms Lough that the effects of the groundwater “take”, and associated activities, will be no more than minor, and that there will be no adverse effects on other nearby abstractive users of groundwater or surface water resources. We are however mindful of the comments of Ms Lough, and accordingly we have been reasonably conservative in our setting of the lake levels to be maintained by the Applicant.

4.3.7 Levels of the Lake and ECMA

176. Our starting point for this part of our evaluation is that the District Plan specifies a lake water level of between 1.2m and 1.5m RL, with a target level of 1.4m RL. The Applicant stated that the nominal water level in the ECMA will be 1.2m RL, which compares with the current normal water level in the inter dune drains of about 1m RL. Shallow groundwater in the area is generally between 1.6m and 2.2m RL.
177. Controlling the level of the lake is the main way of influencing the flow of water through the lake. As we understand it a lower lake level will lead to an increased flow of groundwater into the lake, and this will have benefits because the “turnover time” of the water in the lake will be less, which will have positive effects for lake water quality.
178. In their right of reply the Applicant proposed to lower the nominal minimum level of the lake to 1.1m RL. Further modelling had been undertaken by Ms Williams that showed some increase in off site effects on groundwater levels if the minimum level in the lake were to be set at less than this. We have looked at the results of this modelling, and we are satisfied that this is the case.
179. The main effect of having the lake level too high is a potential loss of water storage to attenuate flooding, with potential adverse effects on downstream properties. The assessment on downstream flood risk, which we describe in Section 4.3.9 below, is based upon a maximum level of 1.5m RL. We are satisfied that this is an appropriate maximum design level for the lake.
180. Similarly we have decided that 1.1m is a suitable minimum design level for the lake. We acknowledge both these levels set can only be targets, and may occasionally be breached due to events beyond the control of the Applicant (such as an intense storm event or a sequence of heavy rainfalls, or a prolonged drought in which groundwater falls below 1.1m RL).
181. We do not consider it necessary to specify a water level in the ECMA. As this is the outlet from the lake the water level will be generally less than in the lake, and it will be higher than in the inter dune drain. We would expect the hydraulic interaction between shallow groundwater and surface water draining from the lake to result in a “normal” level in the ECMA of about 1.2m RL, with a range perhaps of 1.1m – 1.4m RL. We are satisfied that the level of the ECMA can be found “naturally” through the new equilibrium that will be established between surface water and shallow groundwater in this location.
182. How the Applicant decides to engineer the outlets from the lake to the ECMA is not something we need to be concerned about here. The conditions on the consent granted specify the levels within which the lake is to be managed; exactly how that is achieved is for the Applicant to decide.

4.3.8 Water Quality in the Lake and the ECMA

183. Concerns were raised in submissions, such as that from the WDC, about the future water quality in the lake. We share some of those concerns, particularly as the lake is being portrayed in publicity about Pegasus as a recreational asset that will be suitable for secondary contact recreation activities such as yachting and kayaking.
184. In this regard the Applicant confirmed in their right of reply that the swimming bay will be physically separated from the main body of water in the lake, concrete lined, filtered and heated. The water supply to that bay will be of high quality suitable for swimming.
185. In answer to questions Mr Levy provided some additional detail about the proposed lake. He said it would have a maximum depth of 3.5m, which would prevent stratification (i.e. anoxic conditions developing in the bottom of the lake) occurring, while limiting resuspension of sediment (which will affect clarity). The lake shores will have a batter of between 1 in 7 and 1 in 10, and the littoral zone may be lined with shingle to prevent resuspension of sediment due to wave action. The lake will have an approximate volume of 400,000 cubic metres, and a turnover time of about 12 months if average inflow is about 12l/s. Actual turnover time could be more than this because as Ms Lough told us evaporation is expected to average about 6-8l/s, although this will be offset by greater inflows following heavy rain.
186. The eventual water quality in the lake and the ECMA is something of an unknown at this time. It will be affected by a number of factors, most of which are beyond the direct control of the Applicant. These include:
- Most importantly, the quality of the groundwater that will fill the lake as it is excavated.
 - The quality of stormwater discharges entering the lake.
 - The extent to which sediment at the bottom of the lake, and around its shores, is re-suspended due to wave action. This will affect water clarity and aesthetic values.
 - The extent to which waterfowl, such as ducks, swans and geese, inhabit the lake and ECMA. Birds will defecate into the water, leading to microbial contamination.
 - The eventual nutrient status of the lake, which if elevated could lead to green algae in the water column reducing clarity and aesthetic values
187. Of these factors only the quality of the stormwater discharges, the extent of re-suspension around the shore, and perhaps bird populations, are able to be controlled to any significant extent by the Applicant. Mr Levy provided us with a draft lake management plan that outlined how some of the factors under the control of the Applicant are proposed to be managed. This includes the removal of debris and scums from the surface of the lake, minimising problem birdlife and controlling aquatic and marginal vegetation.
188. We note here that the Applicant offered in their right of reply to line the wave zone of the lake with gravels, which will help prevent resuspension of sediment due to wave action, but did not propose a condition to do so. We have decided the best way of providing for this is through the provisions of the Lake Management Plan. In doing so we note that this will require some 10,000 cubic metres of additional gravel being brought on the site, but this is only a 3% increase over what was already projected.

189. As the Applicant cannot control aspects of lake water quality it takes the view that the uses to which water in the lake can be put will need to be determined once the lake is excavated and filled, and monitoring has taken place. This approach was not opposed by the WDC, in whom the lake and ECMA will eventually be vested. Indeed, Mr Young observed that establishing water quality standards now could be “setting (a future consent holder) up to fail”, a view we sympathise with. Accordingly, while we consider that the setting of standards for future use depending on future water quality to be rather circular, we accept that there is no better alternative.
190. We are encouraged that monitoring of the trial lake is showing water quality to be reasonably acceptable. In saying this however, we do not expect long term water quality in the final lake to be of a quality suitable for primary contact recreation. The lake will be shallow and exposed to the wind, will provide suitable habitat for aquatic weeds and attractive habitat for waterfowl, and will have a long turnover time. These factors suggest the lake will be slightly turbid, have something of a green grey colour, and will suffer some microbial contamination.
191. We also have concerns that pest fish, such as perch, carp and rudd, will be introduced to the lake and from there will infest the ECMA. We accept the Applicant’s submissions that it is not practical to provide any fish screens between the lake and ECMA (and those fish could potentially be introduced to the ECMA in any case). We also note that the District Plan encourages fish passage. We do observe however that such introduced fish do have the potential to reduce the value of the ECMA (and to some extent the lake) to native fish, to which we think it provides potentially very attractive habitat.
192. In conclusion, while we have concerns about the eventual water quality in the lake, we accept that this is a matter over which the Applicant can only exert limited influence. Active management will be needed, but the uses to which the waters of the lake can be put will not be known until the lake is well established and monitoring carried out to determine longer term water quality.

4.3.9 Effects of the Water Quality of the Discharge on Downstream Water Bodies

193. Water from the ECMA will on occasions drain out and into the inter dune drain. The main drainage will be towards the south, but there will also be another outlet more to the north. This discharge will not be continuous, particularly during dry periods. Water will be lost from the ECMA both to groundwater soakage and evaporation. Accordingly, our expectation is that the discharge from the ECMA will only occur with any continuity during the wetter months, or following substantial rain.
194. Our first starting point for this part of our evaluation must be the existing water quality in the inter dune drain. The limited sampling undertaken shows water quality in the drain is presently poor, being characterised by high turbidity, elevated nutrient levels, high levels of iron and manganese and high faecal coliform counts. Tutaepatu Lagoon has similarly degraded water quality. Water quality in the inter dune drain is likely to change seasonally and with significant rainfall; we would expect it to be better during wet conditions and the winter/spring period. There was some speculation from the NIWA scientists that this degraded water quality could be due to leakage from the Woodend Sewage Treatment Plant. No evidence was provided to support this assertion, so we consider it speculative and unproven.

195. Our second starting point is the criteria in the PNRRP, the OWDP and the WDC Code of Practice for water quality. In particular the PNRRP contains criteria for artificial lakes based on the ANZECC (2000) guidelines for aquatic ecosystems. We note that some of these criteria may be near impossible to achieve; for instance ammonia concentrations in the shallow groundwater that will feed the lake is about an order of magnitude greater than the relevant ANZECC guideline.
196. Mr Duncan and Dr Chague-Goff from NIWA, both of whom appeared on behalf of the Te Kohaka o Tuhaitara Trust, raised concerns about the effects of the discharge from the ECMA on water quality in the inter dune drain, perhaps the lagoon and on the residual wetlands north towards Waikuku Beach. We think they largely missed the point. All the evidence in front of us shows that water quality in those downstream water bodies will **improve substantially** as a result of the discharge from the ECMA. We need to assess the effects of the discharge on the present environment.
197. Similar concerns were raised by the Waikuku/Rakahuri River and Coastcare Group, who are working to restore the values of the lower Taranaki Stream. They did not want water quality degraded by the discharge from the ECMA.
198. We heard a substantial amount of evidence about what the water quality of the eventual discharge from the ECMA may be. Mr Levy was criticised for changing the information presented in the hydrology report in the AEE with a new “Table D” about the projected water quality of the discharge from the ECMA. His new assessment was that the water quality of the discharge would be substantially improved over what had originally been projected. We understood this is because he has now allowed for a greater level of “treatment” in the lake and ECMA.
199. We think that the eventual quality of the intermittent discharge from the ECMA, while important, cannot presently be projected with much accuracy. The quality will also vary depending on the rate of discharge; generally the higher the rate of discharge the better the quality is likely to be as it will have a greater component of rainfall/treated stormwater versus shallow groundwater present.
200. More importantly, we do not think the ultimate quality of the discharge matters a great deal, provided it is of significantly higher quality than the water presently in the inter dune drain, which we are very confident will be the case. We do not think it matters for instance if the water quality in that discharge is not of a suitable standard for “protection of consumers of aquatic food”, primarily because it will be much improved over current water quality. If people want to collect food or mahinga kai from waters downstream of the ECMA, the assurance can be provided that in future it will be more safe to do so than it is presently. That is a positive feature of the development of the Pegasus water bodies. Similarly, we are not concerned if the quality of the water sometimes breaches trigger levels for protection of aquatic ecosystems, because those are only trigger values that may indicate action is needed. As we have already noted, some of the major factors that will affect water quality in the lake and the ECMA are beyond the Applicant’s control in any case. Because of this, the actions that could be taken are limited, and we need to be realistic about this.
201. We do not think is necessary, nor appropriate, to “engineer” the ECMA to provide additional treatment for stormwater. We have four main reasons for this. Most importantly, we would not want to see the conservation values of the ECMA compromised by such an approach. Secondly, in-situ stormwater treatment in Pegasus town will be to a high standard. Third, the lake and ECMA will provide additional treatment of stormwater in any case. Finally, we are confident that the discharge from the ECMA will improve downstream water quality.

202. We did have a concern about the duration of downstream water quality monitoring originally proposed by the Applicant. We discuss this matter further when we discuss the conditions on which the consents have been granted.
203. There are obviously major positive effects from the creation of the ECMA. We applaud the Applicant's intent to create a wetland area that will replicate the pre historic local environment, and which will have significant benefits for biodiversity and provide habitat for many indigenous species. It seems to us that the creation of the ECMA could have substantial additional benefits if it is managed in conjunction with the adjacent assets that are the responsibility of the Trust. In our view the Trust needs to reflect on how they can best work with the Applicant to provide the synergies that are possible following the creation of the ECMA. Similarly, the Trust should, in our view, be receptive to accepting water from the ECMA to enhance the values of Tutaepatu Lagoon. This is because the water quality in that discharge will undoubtedly be of much higher quality than currently exists in the lagoon, and so could enhance both water quality and quantity therein.
204. In saying this we acknowledge that the Trust has a statutory mandate to manage the assets for which it is responsible, and it is clearly getting on with that. We found the management plan they have prepared to be visionary in the longer term, but realistic in the shorter term. We do consider though that the Trust has had largely unwarranted concerns highlighted by its expert witnesses, and in our view it needs to put those concerns aside and "get alongside" PTL so their conservation work can be complementary. By way of example, the ECMA could provide one of the "hubs" of high conservation value that Dr Scott told us the Trust seeks to create and/or restore.
205. The same considerations apply, albeit to a lesser extent, to the Waikuku/Rakahuri River and Coastcare Group. We applaud this group's intentions to enhance the values of the environs around the lower Ashley River and Waikuku Beach, and we would similarly encourage them to work alongside PTL in doing so.
206. In conclusion, we are strongly of the view that what will be the intermittent discharge from the ECMA will substantially improve downstream water quality in the inter dune drain and ultimately the Taranaki Stream. Discharge water could also be diverted to Tutaepatu lagoon, where it could be used to improve both water quality and quantity.

4.3.10 Effects of the Discharge Upon Downstream Flood Levels

207. Concerns had been raised by several submitters, such as Mrs Kane, Mr Stokes and the Waikuku Water Users Group of the effects of the creation of the lake and the ECMA, and the consequent discharge from the ECMA, on downstream flood levels. Mrs Kane in particular highlighted the vulnerability of the Waikuku Beach area to flooding.
208. Through Mr Levy the Applicant has carried out a comprehensive assessment of the downstream flood risk. This has been reviewed by Mr Brough, and further information was provided in the Applicant's right of reply.
209. We have already discussed the levels of the lake and ECMA. Our assessment of flood risk is based upon the maximum target level we have decided upon for the lake of a nominal 1.5m.

210. The evidence provided by Mr Levy was not contested by any other party, and his evaluation was supported by Mr Brough. We accept his evidence. This shows that for a 1% AEP storm (i.e. a 1 in 100 year event) the effects of the construction of the Pegasus water bodies on downstream flood levels are neutral or slightly positive. In a 0.2% AEP event (i.e. a 1 in 500 year event) downstream water levels are projected to rise by about 30mm over some 190ha downstream of the Pegasus water bodies.
211. We do not think this is a significant effect, given that in such a massive storm other local rivers and streams are certain to have breached their banks and be causing widespread damage in the area around the lower Ashley River. In these circumstances a slightly greater contribution of water from the Pegasus development will have a relatively minor incremental affect. Accordingly, we have concluded that the effects of the development of the Pegasus water bodies on downstream flooding will generally be positive, and that any incremental adverse effects in massive events will be no more than minor.

4.3.11 Positive Effects of the Development

212. We have already commented that we see the restoration works in the ECMA as being a very positive feature of the proposed Pegasus development. We also see the creation of the lake and the amenity it will provide as being positive, although as we have already noted the likely water quality will mean its use is limited to activities that do not involve deliberate contact recreation.

4.3.12 Other Matters

213. There are no other matters that we considered reasonably necessary to determine the applications before us.

4.4 Provisions of Statutory Instruments

214. Two statutory instruments prepared by the CRC are relevant to the present applications. These are the Operative Regional Policy Statement, and the Proposed Natural Resources Regional Plan.

The Regional Policy Statement (“the RPS”)

215. We have examined the relevant Objectives and Policies in Chapters 6 -10 and 12 of the operative RPS. In our view there is nothing in those Objectives and Policies that weigh against granting the consents sought from the CRC.

The Proposed Natural Resources Regional Plan (“the PNRRP”)

216. Variation 1 of the PNRRP, which covers water quality and land use, was publicly notified on 3 July 2004. It is still going through the formal submission process, and no hearings have been held.
217. Accordingly, we are required to have some limited regard to the relevant Objectives and Policies in the PNRRP. We have examined these Objectives and Policies as they relate to the present applications. In our view there is nothing in those Objectives and Policies that weigh against granting the consents sought from the CRC.

The Waimakariri District Plan

218. As we have already noted the development of Pegasus Township is provided for in the OWDP particularly at Policy 18.1.1.11 which specifically provides for the development of a new town at Pegasus subject to listed principles for that development. We have considered Chapter 2 of the OWDP which recognises and provides for the concept of Manawhenua and the practice of Kaitiakitanga in the management of natural and physical resources and to recognise and protect Wahi Taonga and Mahinga Kai resources that are important to Nga Tuahuriri Runanga. We consider the proposal is in accord with those policies.
219. Chapter 3 concerns itself with maintaining and enhancing the natural character and ecosystems of water bodies and their margins and maintaining and enhancing water quality of groundwater aquifers, and finally enhancing the quality and natural functioning of water ways associated with the development and occupation of Pegasus. We consider that the application is in accord with those objectives and policies.
220. Chapter 4 deals with land and water margins and seeks to maintain and enhance the life supporting capacity of the land resource and, among other things, potentially adverse effects to stream margins, aquatic habitats and wetlands and the promotion of land uses which safeguard the life supporting capacity of soils. We agree with Mr Blay that there will be short term adverse effects on aquatic habitats and wetlands during the periods of earthworks, however, the long term benefits that we refer to elsewhere we think will certainly offset those short term effects. We do consider the proposal as not contrary to the objectives and policies in this Chapter.
221. Chapter 6 deals with indigenous vegetation fauna and habitats and seeks to safeguard indigenous biological diversity and ecosystem integrity. The proposal does involve the restoration and enhancement of existing stream margins in wetland areas and will create a large amount of additional wetland area utilising indigenous plant species. Overall we reach the view that the proposal is in accord with the relevant policies and objectives in Chapter 6.
222. Chapter 7 is concerned with the coastal environment and seeks a water quality standard in the coastal environment that maintains natural water quality and protects aquatic ecosystems and natural character while providing recreational and cultural benefits. The scale of the earthworks to be undertaken will potentially create the opportunity for large amounts of sediment and/or dust to be produced. However, like Mr Blay we are of the view that there are mechanisms proposed which will avoid remedy or mitigate potential adverse effects to water quality. Overall, we consider that the proposal is in accord with the relevant objectives in Chapter 7.
223. Chapter 8 deals with natural hazards and seeks to provide protection within the Pegasus site as per Policy 8.2.1.7. The earthworks proposed will in part provide storage stormwater capacity within the lake over and above that which currently exists. Water levels from the lake will be controlled so that the lake does not exceed natural current groundwater and over-topping of banks will not occur. Floor levels will be set above the 0.2% AEP flood level. Accordingly we conclude that the proposal is in accord with the relevant objectives and policies in Chapter 8.
224. Chapter 9 deals with heritage issues and we are satisfied that because investigations of sites exposed during earthworks will be undertaken and protocols will be in place to ensure the correct process should koiwi tangata be found. These processes will

assist the avoidance or mitigation of adverse effects to spiritual and heritage values within the development area.

225. Chapter 12 deals with health, safety and well being and seeks to, among other things, maintain amenity values and the quality of the environment appropriate for the zone in question. Noise is the main issue here. We are satisfied that it is unlikely that the noise levels will exceed the permitted standards contained within the OWDP in relation to construction noise.
226. We note that under s104D(1) we are required however to consider whether the proposal complied with the threshold tests of either having minor effects, or not being contrary to the objectives and policies of the relevant plan. We now discuss this.

4.5 Non-complying Activity Tests

227. Three of the applications before us are for non-complying activities. We can only grant consent for a non-complying activity if we are satisfied that at least one of the limbs of s 104(D) of the Act is met, so that either:
- (a) the adverse effects on the environment (other than any effect to which s104(3)(b) applies), which will be minor; or
 - (b) the application is for an activity which will not be contrary to the objectives and policies of the relevant plan or plans.
228. In this regard we are satisfied that for each of the three non-complying activities the effects on the environment of granting those consents will be minor. We note in particular:
- The works to excavate the lake and ECMA as part of CRC 062174 are required under the provisions of the District Plan. The soil excavated will generally be at least damp, and provided there is good management of dust risk on-site we are confident that the effects of undertaking this activity will be no more than minor.
 - We have already discussed the effects of the “take” of groundwater (CRC 062181) and concluded that the effects of this take on other users of surface and ground water will be no more than minor.
 - The bulk earthworks (RC 055800) to a level of 50ha subject to the conditions proposed will have effects that will be no more than minor.
229. We also consider that these three applications meet the second limb of s104(D) in that they are consistent with the objectives and policies of the relevant plans.
230. In this regard we cannot put much weight on the objectives and policies of the PNRRP as it is little of the way through the statutory process. We have examined the relevant material however, and we have concluded that the two non-complying activity applications to the CRC are generally consistent with those objectives and policies. This is particularly the case given that the groundwater “take” is not a consumptive use.

231. In regard to the bulk earthworks application to the WDC (RC 055800) we agree with Mr Blay's assessment that the proposal is not contrary to the relevant objectives and policies of the OWDP. We have discussed them in greater detail at paragraphs 218-225.
232. In the instance that this assessment is wrong Mr Blay helpfully in his report considers the integrity of the district plan, any precedent effect and any issue emerging from consistent decision making having regard to past decisions. He notes that the proposal is substantially different to proposals likely to be received in the future because of the specific zoning provisions we have already referred to. In relation to consistent administration of the OWDP he notes that there are no other Pegasus 6, 6A or Pegasus Rural Zones in the district. He notes in any event there have been other relatively large scale earthworks which have been approved elsewhere in the district. He reaches the view, which we agree with, approval of this application would not result in any integrity or precedent issues and nor would it result in any criticism about the consistent administration of the OWDP.

4.6 Part II of the Act

Section 5

233. This section of the Act defines sustainable management. We consider the present applications are consistent with the definition in the Act, noting particularly that:
- The proposed activities will allow the applicants and the local community to help provide for their social and economic needs. It will also provide significant employment opportunities, and other downstream benefits, for the local community and the future residents of Pegasus town.
 - The proposed activities will not compromise the reasonable needs of future generations, nor will they have adverse effects on the life supporting capacity of water or ecosystems. Indeed there will be positive effects for life supporting capacity through the creation of wetland habitat.
 - The potential adverse effects of the proposed activities can be adequately avoided or mitigated through the conditions imposed on the consents granted.

Section 6

234. Section 6 of the Act lists seven matters of national importance that we must recognise and provide for in this decision. Three of these matters are potentially relevant to the present application.
235. There are in the area that will become the ECMA significant existing areas of indigenous vegetation, and associated habitat for indigenous fauna (such as mudfish). Our understanding of the restoration process for the ECMA is that the existing indigenous vegetation will be maintained in so far as this is compatible with the full development of the ECMA. Where possible, fish will be captured and removed prior to restoration works being carried out.
236. The eventual aim of the restoration works in the ECMA is to create a habitat that will comprise areas of significant indigenous vegetation, and habitat for indigenous fauna. We are satisfied that any adverse short term construction effects on indigenous flora and fauna will be far outweighed by the long term benefits associated with the construction of the ECMA.

237. We are also satisfied that the proposed development will not have any adverse effects on the water regime in Tutaepatu Lagoon. Opportunity is provided to enhance both water quality and quantity in the lagoon by piping some discharge water from the ECMA to the lagoon.
238. Section 6(e) requires the consideration of the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu and other taonga.
239. As discussed in the evidence of Mr Lenihan, the applicant has worked closely with tangata whenua. The proposed development is close to the site of Kai-a-poi pa, which is of great cultural significance to Ngai Tahu. Further, there is no discharge of untreated stormwater to water, and the associated proposal for Pegasus town allows for the protection of a historic greenstone working site. Accordingly we conclude that the proposed development is consistent with Section 6(e) of the Act.
240. Section 6(f) means that we must consider historic heritage. This was addressed comprehensively by Dr Witter, and is provided for in the Section 12 HPT consent. There is an accidental discovery protocol. We have provided for these matters in the conditions of consent, and are satisfied the applications are consistent with Section 6(f) of the Act.

Section 7

241. This section of the Act lists eleven matters that we must have particular regard to. Four of these matters are of potential relevance to the present application.
242. The first of these matters is kaitiakitanga. Tuahuriri consider themselves as kaitiaki of the subject land, and they were strongly involved in the planning process for the development. We are satisfied that their involvement means the kaitiaki status of Tuahuriri has been had particular regard to in developing the overall concept for Pegasus Town.
243. The amenity values of the present site are low. These values will be much enhanced by the development of the lake, and particularly the ECMA.
244. Granting the present applications will have effects on the quality of the environment. As we have already discussed in some detail, we see most of those effects as being relatively neutral,
245. Mr Duncan had suggested the discharge from the ECMA may affect the habitat of trout. Questioned about this he said this would be where the inter dune drain enters the Taranaki Stream. As we have already noted, the discharge from the ECMA is expected to improve ambient water quality in the inter dune drain. Accordingly, we find that the discharge from the ECMA will have no adverse effect on the habitat of trout.

Section 8

246. The information available to us indicates that the present applications are not inconsistent with the Principles of the Treaty of Waitangi. We were not made aware of any taonga that need active protection that would be compromised by granting the applications.

4.7 Section 105 of the Act

247. As the application is for a discharge to the environment regard must be had to the criteria in Section 105(1) of the Act, which are
- (a) *“the nature of the discharge and the sensitivity of the receiving environment to adverse effects;*
 - (b) *the applicant’s reasons for the proposed choice; and*
 - (c) *any possible alternative methods of discharge, including discharge into any other receiving environment”.*
248. Case law requires the consent authority to find whether, in proposing a discharge of contaminants, the applicant has given adequate consideration to alternatives that would avoid, remedy or mitigate the effects of the discharge of contaminants, and then made a reasoned choice.
249. In this case the applicant’s choices are constrained by the Environment Court’s direction that stormwater disposal from Pegasus Town be via ground soakage. Discharge to any other receiving environment is not possible.
250. We are satisfied that given the constraints faced by the applicant, the choices of stormwater treatment and disposal are consistent with best practice on a site such as Pegasus. Discharges from each of roofs of urban dwellings, run-off from hardstand and roads in the urban area, and stormwater from the business area are treated to an appropriately high standard prior to discharge to land. Accordingly, we are satisfied that the applicant has made reasoned choices in relation to stormwater treatment from Pegasus Town, and so has met the criteria in s 105(1) of the Act.

4.8 Section 107 of the Act

251. We must also have regard to the criteria in Section 107 of the Act, which apply to all discharges to water after reasonable mixing. We are confident that in the longer term all the discharges from the Pegasus site, including those of treated stormwater to the lake, will meet s 107 criteria. During the construction of the site, and particularly during the excavation of the ECMA, there is potential for sediment laden water to be discharged off site. We are satisfied that the construction procedures outlined by Mr Gardiner will ensure such effects are avoided in so far as it possible (there may for instance be some discharges following very heavy rain). Any resulting breaches of s 107 standards will be only temporary, and accordingly the exemption provisions in s 107(2) can be applied.

4.9 Overall Conclusion of our Evaluation

252. Having considered all of the relevant matters under Section 104 and Part II, as discussed above, we consider that all the applications can be granted subject to appropriate terms and conditions. Our main reasons for this are as follows:
- In relation to the consent applications to the CRC, we consider that provided good construction management practice is followed on the site, the effects of the activities for which consents are sought will be no more than minor. Stormwater treatment is comprehensive, the “take” of groundwater will not have adverse effects on other water users, there are potentially positive benefits for downstream water quality and off site flood risk is decreased for all but extreme

events. There are positive effects from the creation of the ECMA. Our only reservation is that eventual water quality in the lake is unlikely to be high, but this is largely beyond the control of the Applicant.

- The two applications to the CRC for non complying activities can be granted because in both cases effects on the environment are no more than minor.
- In relation to the consent application to the WDC we have concluded that, having regard to the mitigation measures proposed, the effects on the environment will be no more than minor.
- There are no provisions in either the operative Canterbury Regional Policy Statement, nor in the Proposed Natural Resources Regional Plan, that weigh against granting the applications.
- In relation to the Objectives and Policies of the OWDP we are satisfied that the proposed earthworks are in accord with those policies and objectives.
- The applications meet the requirements of Sections 105 and 107 of the Act.
- The proposed development is consistent with the principle of sustainable management in Section 5 of the Act, and there are no other Part II matters that weigh against granting the applications sought.

5 Conditions

253. There were eight main matters relating to the conditions on which the consent is granted that we had to consider carefully. We discuss these in turn.

Duration of Consents for Construction

254. All the applications to the CRC were sought for a duration of 35 years. Five of those consent applications are for activities associated with site construction, such as excavation of the lake and ECMA, and associated discharges of water during construction.
255. In their right of reply the Applicant suggested these consents be granted for 15 years. We are comfortable with that, particularly given that this is the same time for which the construction consents were granted by us for the associated development of Mapleham. In doing so, we suggest that the Applicant surrender the consents related to the construction of the site once that construction is completed. This will ensure that they are not charged fees for the administrative costs of consents that are no longer necessary.

Generic Conditions

256. There are four matters that we have covered with conditions that relate to all the consents granted by the CRC. These are the provision of an annual report, a requirement that management plans be regularly reviewed, a generic review condition (which was suggested for only some consents) and a condition requiring all samples be analysed to satisfactory standards. We have also included the first two of these conditions on the consent granted by the WDC.

Management Plans

257. The applicant proposed to prepare several management plans detailing how activities will be carried out. This approach was supported by the reporting officers. Examples included lake, ECMA and construction management plans.
258. We are generally comfortable with the preparation of these plans, as we accept that not all matters of detail need to be covered by the consents that we have granted. In saying this however, there were a few matters about which we had some disquiet.
- We consider the consent holder should be required to comply with the provisions of all of these management plans, and we have provided for this in our decisions.
 - We also think these plans should be reviewed at least annually for the plans associated with construction activities, and at least once every three years for the lake management and ECMA management plans. We have required this in the conditions of consent.
 - We do not think it is appropriate that early reviews of monitoring of matters such as lake water quality should be determined through management plans. The applicant had in places sought that monitoring be reviewed after two years via the provisions of a management plan. We have instead allowed for this after five years. If the applicant can provide a good case to vary the monitoring we consider necessary prior to that time, they have the opportunity to do so through the provisions of s 127 of the Act.

Duration of Monitoring

259. The applicant suggested that monitoring of water quality in the lake, the ECMA and the downstream inter dune drain, and the flow from the ECMA take place for two years, and that this be reviewed through a management plan. As we noted above we are not in agreement with this approach. We have required such monitoring take place for five years until such a review takes place. As we have noted if there is a good case to vary the monitoring programme prior to that time, the applicant has the opportunity to do so through the provisions of s 127 of the Act.

Lining of the Lake

260. We believe it will be beneficial for the littoral zone of the lake to be lined with material such as gravel. This will help stabilise the shores of the lake, and it will limit resuspension of sediment due to wave action. We do not have sufficient information in front of us to determine how this would best be achieved, and over what lake levels. We are satisfied that this matter can be addressed through the lake management plan.

Monitoring of Flows from the ECMA

261. The applicant had proposed a condition that required monthly monitoring of flows from the lake to the ECMA and from the ECMA to the inter dune drains. They had also proposed that if flows exceeded 100l/s for more than a calendar month, they would carry out a study of the effects of the discharge on downstream property owners.

262. We can see no good reason why continuous monitoring of flows out of the ECMA cannot be provided for. This will simply involve calibrating flow over a weir or similar structure, and then continuously recording levels. We have required this in the conditions of consent.
263. We also considered requiring continuous monitoring of the flow from the lake to the ECMA. We cannot however see any particularly good reason for doing so, although we believe having this information will help provide a better understanding of the future water quality of the lake, and we would encourage the applicant to also provide for continuous flow monitoring at these outlets.
264. We did not have any information about why an average discharge of 100 l/s over one month may have adverse effects on downstream property owners. Rather it could be that a flow of more or less than this for a longer or shorter period may have such effects. In the absence of such information we have accepted the applicant's figure of 100 l/s, but reduced the duration of this flow being exceeded to a fortnight. This is because we think it is not very likely that such flows would be exceeded for a month in all but the wettest conditions. We also believe downstream effects will need to be monitored as the trigger levels we have set may not be appropriate.

Monitoring of the Effects of the Stormwater Discharge from the Business District

265. There was some philosophical difference between the applicant and the reporting officer on the best way of monitoring the effects of the treated discharge on the water quality of the lake. In essence, the officer recommended the most extensive monitoring be carried out of the quality of the water in the discharge after it leaves the sand filters, while the applicant sought to carry out such monitoring after mixing in the lake.
266. We accept that the applicant's approach is most consistent with the effects based approach under the RMA. We consider however that focusing on monitoring of the quality of the discharge will provide better information on the effectiveness of the stormwater treatment provided in the business district. The source water will potentially be the most contaminated stormwater discharged from Pegasus Township, and we would expect monitoring to show that treatment is sufficiently effective. We have also provided for some monitoring of the effects of the discharge on lake water quality.

Monitoring of the Water Quality of the Lake and ECMA

267. The applicant proposed that the water quality of the lake and ECMA be sampled monthly for five years, with a review through the provisions of the management plan after two years. We are not satisfied with either the scope of monitoring proposed or its duration, which we have required be for five years prior to any review. We have also required additional sampling for nutrients and turbidity. We think that this is particularly important for sampling of the water quality of these two open water bodies, as the relationships between factors such as inputs, nutrients, suspended sediment and biota will take some time to come to an equilibrium.

268. We also note that in relation to the water quality of the lake we have removed the proposal that it be of “an aesthetically pleasing visual appearance”. We think this is much too subjective to be included as a condition of consent.

Dated this 25th day of August 2006

Paul Rogers
Chairperson of Commissioners

6 Decisions

That pursuant to Sections 102, 104, 104B and 108 of the Resource Management Act, resource consent applications CRC062168, CRC062169, CRC062170, CRC062173, CRC062174, CRC062175, CRC062177, CRC062178, CRC062179, CRC062181, CRC062183, CRC062184 and R055800 are granted subject to the following conditions:

1. The consent holder shall, by 31 March every year for the duration of these consents, prepare an annual report to the Canterbury Regional Council covering activities carried out under consents CRC062168, CRC062169, CRC062170, CRC062173, CRC062174, CRC062175, CRC062177, CRC062178, CRC062179, CRC062181, CRC062183 & CRC062184 in the previous calendar year. This report shall include, but not be limited to:
 - (a) An outline of any major physical works carried out in the previous calendar year;
 - (b) Compliance with the Archeological Sites Protocol describe in conditions 17 – 27 inclusive for consents CRC062168, CRC062169, CRC062170, CRC062173, CRC062174, CRC062175 and R055800;
 - (c) Any maintenance registers;
 - (d) Any remedial works carried out, including the number of infiltration swales remediated;
 - (e) A register of any complaints received, and the actions undertaken to resolve those complaints;
 - (f) Copies of any periodically updated management plans prepared pursuant to these consents;
 - (g) A summary of all visual inspections of lake aesthetics;
 - (h) A summary of all monitoring undertaken pursuant to these consents, with a discussion of any unexpected or unusual results. Detailed results of monitoring shall be provided in appendices; and
 - (i) In the event of a storm with a return period of 10% Annual Exceedance Probability or greater, an evaluation of the performance of the stormwater treatment from the business zone, the effects on levels of and water quality in the lake, the Eastern Conservation Management Area and the inter dune drain, and any effects of the discharges on flooding of properties downstream.
2. Pursuant to Section 128 of the Resource Management Act 1991, the Canterbury Regional Council may review the conditions of all of the above described consents by serving notice on any of the last five working days of January each year, for any of the following purposes:
 - a) To deal with any adverse effect on the environment which may arise from the exercise of the consent and which it is appropriate to deal with at a later stage, or
 - b) To require the consent holder to adopt the best practicable option to remove or reduce any adverse effect on the environment.
3. The contractor's environmental management plan shall be updated at least annually for the duration of construction on the site. Updates of this management plan shall be provided to the Canterbury Regional Council: Attn. RMA Compliance and Enforcement Manager. The first of these periodic reviews shall be no later than 31 March 2008.

4. The management plans for stormwater management, the lake and the Eastern Conservation Management Area shall be updated at least once every three years for the duration of the relevant consents. Updates of these management plans shall be provided to the Canterbury Regional Council: Attn. RMA Compliance and Enforcement Manager. The first of these periodic reviews shall be no later than 31 March 2010.
5. Any samples taken in accordance with conditions in these consents shall be analysed using the most appropriate scientifically recognised and current method by a laboratory that is certified for that method of analysis by an accreditation authority such as International Accreditation New Zealand (IANZ).

Applications

- **CRC062168 to clear vegetation;**
- **CRC062169 to excavate within waterways;**
- **CRC062173 to restore wetlands;**
- **CRC062174 to excavate the lake and conservation management areas;**
and
- **CRC062175 Discharge water/contaminants during construction**

for a term expiring on 25 August 2021; and

Application

- **CRC062170 for the placement of structures for a term expiring on 25 August 2041**

On the following terms and conditions:

1. The work shall be carried out in general accordance with the activity details set out in the application, the associated assessment of effects, dated December 2005, and lodged with the consent authority and the following design drawings (or approved equivalent):
 - Beca 60079/300-302
 - Beca 60079/261-263
 - Beca 3380505-0-CK75-76
 - Beca 3380505-0-CK70
2. The works outlined in consent CRC062170 condition 1 shall be inspected on an annual basis and maintained as required. All maintenance work shall be recorded in a register by the consent holder. The consent holder shall include a copy of this register in the Annual Report to the Canterbury Regional Council.
3. The lapsing provisions of Section 125 of the Resource Management Act 1991 will apply on expiry of ten years from the date of commencement of these consents.

Site Development work (including works in the bed/margins waterways)

4. Prior to construction work commencing under any major contract on the Pegasus Town site, a Contractor's Environmental Management Plan shall be prepared for that contract.

The Plan shall detail the sediment control measures and the monitoring programme that shall be put in place to mitigate any adverse effects of construction activities, and shall set out how conditions 7 to 12 of this consent shall be complied with. This Plan shall be submitted to the Canterbury Regional Council, attention: RMA Compliance and Enforcement Manager, at least 10 working days prior to any construction work commencing. A copy shall also be held by the consent holder along with a copy of the consent. A copy shall also be held on the site.

5. If the measures detailed in the Contractor's Environmental Management Plan do not show compliance with the conditions of this consent, then the Plan shall be reviewed, updated and resubmitted to the Canterbury Regional Council, attention: RMA Compliance and Enforcement Manager, within 10 working days of any identification, by any party, of non-compliance with the conditions of this consent.
6. The consent holder shall ensure that the measures and procedures set out in the Contractor's Environmental Management Plan are complied with at all times.
7. The Contractor's Environmental Management Plan shall include sediment control measures, such as described in ARC TP90 "*Erosion and Sediment Control Guidelines for Land Disturbing Activities*", for the interception and treatment of stormwater run off from the works on the site, particularly in relation to any potential runoff from the main site to the Eastern Conservation Management Area and from the Eastern Conservation Management Area to downstream areas. The design of these devices shall be submitted to Waimakariri District Council for engineering approval before any work starts on site. A map showing the location of these measures shall be submitted along with the Contractor's Environmental Management Plan required under condition 4. Should the locations of the sediment control measures change, the map shall be updated and resubmitted to the Canterbury Regional Council, attention: RMA Compliance and Enforcement Manager.
8. Vehicles and machinery shall, as far as practicable, not enter channels containing flowing water.
9. In the event of any accidental spillage, the consent holder shall inform the Canterbury Regional Council, attention: RMA Compliance and Enforcement Manager, within 24 hours of the event, and shall provide the following information:
 - a) The date, time, location, and estimated volume of the spillage.
 - b) The cause of the spillage, details of the steps taken to control and remediate the effects of the spill on the receiving environment, and measures taken to prevent a reoccurrence.

Monitoring

10. (a) Any waterway that leaves the site or is outside the site that receives water from stormwater treatment devices shall be monitored for turbidity, at not less than 6 monthly intervals, at a location 10 m upstream of the point of discharge and 50 m downstream of the point of discharge, while discharge from the stormwater treatment device is occurring. The monitoring locations shall be identified on a map to be provided to the Canterbury Regional Council, attention: RMA Compliance and Enforcement Manager, along with the Contractor's Environmental Management Plan required under condition 4. Should the location of the points of discharge change, an updated map shall be provided to Canterbury Regional Council, attention: RMA Compliance and Enforcement Manager.

- (b) The downstream readings shall not be more than 20 % or 50 NTU higher than the upstream readings.
 - (c) Turbidity shall be measure with a hand held turbidimeter. This shall be calibrated according to the manufacturer's instructions. Records of the calibration shall be kept by the consent holder, and made available to Canterbury Regional Council upon request.
11. In the event that the increase in turbidity exceeds that specified in Condition 10, immediate corrective action shall be taken to improve the performance of the treatment device. The sampling in Condition 10(a) shall be continued until the necessary improvements have been made to the quality of the discharge and the readings show compliance with Condition 10(b).
 12. The readings taken in Condition 11 shall be recorded and forwarded to Canterbury Regional Council, attention: RMA Compliance and Enforcement Manager, along with a short report outlining any corrective measures required in Condition 11, within 10 working days after the first breach and at monthly intervals until the limits in condition 10 are met.

Waterways / EASTERN CONSERVATION MANAGEMENT AREA

13. The Eastern Conservation Management Area Management Plan shall be prepared in accordance with the District Plan requirements and in consultation with the Waimakariri District Council and submitted to the Canterbury Regional Council, attention: RMA Compliance and Enforcement Manager, prior to earthworks in the Eastern Conservation Management Area commencing. This Plan shall address all works to be undertaken within the Eastern Conservation Management Area, including construction, maintenance, management and operation. A copy of this Plan shall also be held by the consent holder along with a copy of the consent. Where necessary, this Plan may be reviewed, updated and resubmitted to the Canterbury Regional Council, attention: RMA Compliance and Enforcement Manager.
14. The consent holder shall ensure that the measures and procedures set out in the Eastern Conservation Management Area Management Plan are complied with at all times.

Ecological issues

15. Should the consent holder wish to protect flora and fauna present at the site by removing it from the site during construction then the Applicant shall prepare a report prior to any removal and at 3 monthly intervals detailing:
 - (a) the flora and fauna that are removed
 - (b) the conditions that are required on site for its return
 - (c) the management measures required upon its return-

and forward it to Canterbury Regional Council Attn RMA Compliance and Enforcement Manager.

The consent holder shall also report to Canterbury Regional Council attention: RMA Compliance and Enforcement Manager when the flora and fauna are returned.

16. In the event that works are required in native fish spawning or migration areas, and such fish have not been removed from those areas, the consent holder shall use all best

endeavours to ensure that works are undertaken outside such periods of fish spawning and migration

Archaeological Sites Protocol

17. A consulting archaeologist shall monitor all earthmoving undertaken in accordance with these applications and shall advise on methods to be undertaken to ensure that adverse effects on archaeological values are avoided, remedied or mitigated. The consent holder shall consult with Te Rūnanga o Ngāi Tahu and Te Ngāi Tuāhuriri Rūnanga regarding the appointment of the archaeologist.
18. The consent holder shall provide to the consulting archaeologist, Te Rūnanga o Ngāi Tahu and Te Ngāi Tuāhuriri Rūnanga, the following information no less than 25 working days prior to any earth-moving works:
 - a) A schedule of the dates of all significant earthmoving events, their sequence and duration.
 - b) A summary of all measures being undertaken to ensure that adverse effects on archaeological values are avoided, remedied, reduced or mitigated.
19. The consent holder shall invite Te Rūnanga o Ngāi Tahu and Te Ngāi Tuāhuriri Rūnanga to attend any episode of monitoring or earthmoving activity.
20. The consent holder shall provide Te Rūnanga o Ngāi Tahu and Te Ngāi Tuāhuriri Rūnanga and the New Zealand Historic Places Trust with a copy of all archaeological monitoring and investigation results which are required by the conditions of this consent with an invitation to respond, comment or meet to discuss any results.
21. The consent holder shall notify Canterbury Regional Council, attention: RMA Compliance and Enforcement Manager, of all information provided to Te Rūnanga o Ngāi Tahu and Te Ngāi Tuāhuriri Rūnanga and any responses received. If appropriate, the Council, with the agreement of the consent holder and Te Rūnanga o Ngāi Tahu and Te Ngāi Tuāhuriri Rūnanga, shall convene meetings/hui should any of the information or issues require further discussion.

Waahi Taonga, Waahi Tapu and Urupa Protocol

22. A representative of Te Ngāi Tuāhuriri Rūnanga shall be engaged to be present during construction and excavation of all works undertaken in accordance with these applications, to act as advisor to the developer on identification or protection of waahi tapu, waahi taonga, urupa or historic cultural sites.
23. The consent holder shall consult with Te Rūnanga o Ngāi Tahu and Te Ngāi Tuāhuriri Rūnanga to determine, in accordance with tikanga Maori, if there are any matters of protocol which tangata whenua wish to undertake in relation to the commencement of any development works, significant events or the commissioning of the completed works.
24. The consent holder shall ensure that staff involved with earthmoving activities have received training and are aware of the requirement to monitor earthmoving activities in a way that enables the identification of waahi tapu, waahi taonga, urupa or historic cultural sites. Te Rūnanga o Ngāi Tahu and Te Ngāi Tuāhuriri Rūnanga shall be contracted to provide appropriate training to such staff.

25. Immediately that it becomes apparent that an urupa, waahi tapu, waahi taonga or suspected historical site has been uncovered, earthmoving operations shall stop. The contractor will shut down all machinery or activity immediately, leave the area and advise the consent holder of the occurrence.
26. In cases other than suspected koiwi tangata (human remains), the representative of Te Ngāi Tuāhuriri Rūnanga will be consulted by the consent holder of the site to determine what further actions are appropriate to safeguard the site or its contents, and to avoid, reduce, remedy or mitigate any damage to the site.
27. Where koiwi tangata (human remains) are suspected:
 - a) The consent holder will take steps immediately to secure the area in a way that ensures the koiwi tangata are untouched.
 - b) The consent holder shall be responsible for notifying the Te Ngāi Tuāhuriri Rūnanga, the Police and the Historic Places Trust and that it is suspected koiwi tangata have been uncovered.
 - c) The consent holder of the site will see that staff are available to meet and guide kaumatua, Police and Historic Places Trust staff to the site, assisting with any requests that they may make.
 - d) Earthmoving operations in the affected area will remain halted until the kaumatua, the Police and Historic Places Trust staff have marked off the area around the site and have given approval for earthmoving operations to recommence.
 - e) If the kaumatua are satisfied that the koiwi tangata are of Maori origin the kaumatua will decide what happens to the koiwi tangata and will give their decision to the Police, the archaeologist and the consent holder.

Application CRC 062179 for the discharge of stormwater for a term expiring on 25 August 2041 on the following terms and conditions:

1. The work shall be carried out in general accordance with the activity details set out in the application the associated assessment of effects, dated December 2005, and lodged with the consent authority and the following design drawings (or equivalent):
 - Beca 60079/300-302
 - Beca 60079/261-263
 - Beca 3380505-0-CK75-76
 - Beca 3380505-0-CK70
2. The discharge shall be:
 - a) stormwater to ground from roofs, roading, and other hardstand areas outside the Business zones of Pegasus Town as identified on the map CRC062179, for storm events of up to 10% annual exceedance probability (AEP);
 - b) stormwater overland to the lake at or about map references NZMS 260 M35: 8545-6685-NZMS 260 M35: 8564-6606 from roofs, roading and other hardstand areas outside the Business zones of Pegasus Town, for storm events greater than the 10% AEP;
 - c) stormwater overland to the Eastern Conservation Management Area between map references NZMS 260 M35: 8589-6726-NZMS 260 M35: 8561-6527 from roofs,

- roading and other hardstand areas outside the Business zones of Pegasus Town, for storm events greater than the 10% AEP;
- d) stormwater to the lake from Business zones via a piped reticulation system discharging at or about map references NZMS 260 M35: 8552-6607 to NZMS 260 M35: 8535-6644, for storm events of up to 10% AEP; and
 - e) stormwater overland to the lake from the Business zones at or about map references NZMS 260 M35: 8552-6607 to NZMS 260 M35: 8535-6644, for storm events of greater than 10% AEP.
3. The lapsing provisions of Section 125 of the Resource Management Act 1991 will apply on expiry of ten years from the date of commencement of this consent.
 4. At least 30 working days prior to commencing construction of the stormwater treatment system the consent holder shall submit to the Canterbury Regional Council, attention: RMA Compliance and Enforcement Manager:
 - a) Design plans relating to the stormwater treatment and disposal system including any sumps, infiltration areas, gravel soakage trenches and sand filters,
 - b) All assessments and calculations undertaken to ensure compliance with conditions 5 to 10 of this consent.
 5. The primary stormwater drainage system from the Business zones shall be a piped system, with treatment to a quality performance standard equivalent to that of Auckland Regional Council Technical Publication 10 prior to discharge to the lake.
 6. The primary stormwater drainage systems from the roads (outside the Business zones) shall be a swale and stormwater infiltration system designed and constructed to achieve a stormwater quality performance standard equivalent to that of Auckland Regional Council Technical Publication 10 prior to discharge to ground soakage. The surface swale/infiltration basins shall be designed to treat the runoff associated with the first 18 millimetres of any rainfall event from the contributing catchment area. Discharge for stormwater above the first 18 millimetres of rainfall and up to the 10% AEP storm shall be to ground via a sump containing a catchpit filter or equivalent and a submerged outlet.
 7. The primary stormwater drainage system for roofs from individual properties, other than in the Business zones, shall be by soakage to the ground.
 8. The primary stormwater drainage system shall be designed to manage the 10% AEP storm without resulting in secondary overland flows.
 9. For storm events with a greater than 10% AEP discharge shall be to the lake or Eastern Conservation Management Area by secondary overland flow paths. These flows shall not result in any flooding of houses for storm events up to those with a 1% AEP.
 10. As part of the design, the combined effects of earthworks cut and fill on the Pegasus township site, plus any additional stormwater runoff volume associated with the development of the site, shall be assessed for net available flood runoff storage volume. Following development, at any level up to the 1% annual exceedance probability storm flood level, there shall be no decrease in the volume of flood water storage available in the interdune flood plain area compared to the volume that was available prior to development.
 11. A certificate signed by the person responsible for designing the stormwater system, or another competent person shall be submitted to the Canterbury Regional Council, attention: RMA Compliance and Enforcement Manager, within one month of construction of each stage, to certify that the system has been constructed and installed

in accordance with the plans, design details and procedures submitted with the application as required by condition 4 of this consent.

Maintenance and Monitoring

12. A Stormwater Management Plan detailing the operation and maintenance of the stormwater system, including compliance with conditions of this consent, shall be developed for the site in conjunction with the Waimakariri District Council and submitted to the Canterbury Regional Council, attention: RMA Compliance and Enforcement Manager, prior to commencing the operation of the system. This Plan shall show compliance with conditions 14 to 23 of this consent. A copy shall also be held by the consent holder along with a copy of the consent. Where substantive changes result to the operations and maintenance of the stormwater system, the Plan shall be resubmitted to the Canterbury Regional Council for approval.
13. The operation and maintenance of the stormwater system shall at all times comply with the Stormwater Management Plan required under condition 12 of this consent.
14. In the event of any accidental spillage of a potentially hazardous material affecting the stormwater discharge, the consent holder shall inform the Canterbury Regional Council, attention RMA Compliance and Enforcement Manager, within 24 hours of becoming aware of the event, and shall provide the following information:
 - a) The date, time, location, and estimated volume of the spillage.
 - b) The cause of the spillage, details of the steps taken to control and remediate the effects of the spill on the receiving environment, and measures taken to prevent a reoccurrence.
15. (a) At least once every five years soil in the infiltration swales shall be sampled at representative sites across the site in accordance with the Stormwater Management Plan. The samples shall consist of a composite soil sample of cores taken from the ground surface to a depth of 50 mm. These samples shall be taken from the point of lowest elevation of the infiltration swale. The samples shall be taken by a suitably experienced person and analysed for the following determinands:

Total Zinc	(mg/kg dry weight soil)
Total Copper	(mg/kg dry weight soil)
Benzo(a)pyrene	(mg/kg dry weight soil)
- (b) If any determinand measured in accordance with Condition 15 (a) exceeds the concentrations specified below, 100 mm of topsoil shall be removed from the affected area of the infiltration swale and taken to an approved place for disposal or treatment. The soil shall be replaced with uncontaminated soil.

TRIGGER LEVELS

Total Zinc	200 mg/kg
Total Copper	100 mg/kg
Benzo(a)pyrene	1.64 mg/kg

(c) The results of the analyses undertaken, the name of the person taking the sample(s), the date and time of sampling, and any interpretation required of the results shall be provided to Canterbury Regional Council, attention: RMA Compliance and Enforcement Manager, within 20 working days of receipt of the analytical results from the laboratory.

16. All catchpits, swales, sediment traps, sand and rock filters shall be inspected at not less than 6 monthly intervals. Any visible sediment and litter on the swales shall be removed. All other necessary measures shall be undertaken to ensure that the catchpits, swales, sediment traps, sand and rock filters are operating in accordance with the design details and procedures submitted to the Canterbury Regional Council as required in condition 4 of this consent and in accordance with the Stormwater Management Plan.
17. Any sediment removed in accordance with Condition 15 and 16 shall be disposed of at an appropriate facility, and the consent holder shall provide Canterbury Regional Council, attention: RMA Compliance and Enforcement Manager with written confirmation of any such disposal in the Annual Report.
18. Records of the operation and maintenance of the stormwater system shall be kept by the consent holder. Copies of these records shall be provided to the Canterbury Regional Council, attention: RMA Compliance and Enforcement Manager on request.
19. (a) Discharge from the sand filter shall be sampled following a rainfall event of greater than 10 millimetres at least once during each 12 month period from the time the sand filters start discharging, for the duration of this consent. The discharge shall be monitored for faecal coliforms, concentration of dissolved oxygen, water temperature, natural pH, visual clarity, copper, zinc and total suspended solids. Following dilution with ambient lake water within the zone of non-compliance, the discharge shall meet the following criteria:
 - (b) The results of the analyses undertaken, the name of the person taking the sample(s), the date and time of sampling, and any interpretation required of the results shall be provided to Canterbury Regional Council, attention: RMA Compliance and Enforcement Manager, within 20 working days of receipt of the analytical results from the laboratory
20. Water quality sampling shall be undertaken approximately quarterly following a rainfall event greater than 10mm at the edge of the zone of non-compliance (as defined in the Natural Resources Regional Plan) and at two locations from the lake representative of ambient conditions in accordance with the Lake Management Plan. This sampling shall be undertaken for the first five years of the lake being fully excavated, when the frequency and scope of sampling may be reviewed in accordance with the monitoring component in the Lake Management Plan and agreed in writing by the CRC. Water quality shall be monitored for E coli, concentration of dissolved oxygen, water temperature, natural pH, visual clarity, copper, zinc, total suspended solids, turbidity, total nitrate, total phosphate and dissolved reactive phosphate.
21. The stormwater discharge to the lake shall meet the following criteria following dilution with ambient lake water within the zone of non-compliance as defined in the NRRP, assessed by comparing the ambient water quality with the water quality at the edge of the zone of non-compliance:

- (a) The concentration of *Escherichia coli* shall not increase by more than 130 *E. coli* per 100 millilitres.
 - (b) The concentration of dissolved oxygen in water shall exceed 80% of saturation concentration at any time measured at any depth at least 0.5 metres below the surface of the lake.
 - (c) The natural water temperature shall not be changed by more than one degree Celsius.
 - (d) The natural pH shall not be changed by more than 0.5pH units.
 - (e) The visual clarity of the water shall not be reduced by more than ten percent.
 - (f) The natural colour of the water shall not be changed by five Munsell units.
 - (g) There shall be no increase in conspicuous oil or grease films, scums or foams, or floatable or suspended materials excluding those of natural origin, compared to background levels.
22. Copies of the sampling and monitoring results shall be provided on request to the Canterbury Regional Council, attention: RMA Compliance and Enforcement Manager.
23. Should water pond for a period in excess of greater than 48 hours following the end of a rainfall event in any infiltration swale then the swale shall be remediated as soon as practicable to improve the infiltration rate back to a design level of greater than 10 millimetres per hour but no more than 50 millimetres per hour. This ideally shall be measured by flooding the infiltration swale with water to a depth of 100 millimetres and observing the rate of decline. Alternatively a double ring infiltrometer may be used. However the infiltration rates measured using the double ring infiltrometer shall be halved to obtain a more representative infiltration rate of the swale.

Application CRC 062177 for the discharge of water from the lake to the Eastern Conservation Management Area for a term expiring on 25 August 2041 on the following terms and conditions:

1. The work shall be carried out in general accordance with the activity details set out in the application and associated assessment of effects, dated December 2005, and lodged with the consent authority.
2. The lapsing provisions of Section 125 of the Resource Management Act 1991 will apply on expiry of ten years from the date of commencement of this consent.

Application CRC 062178 for the discharge of water from the Eastern Conservation Management Area to ground and to local drains for a term expiring on 25 August 2041 on the following terms and conditions:

1. The work shall be carried out in general accordance with the activity details set out in the application and associated assessment of effects, dated December 2005, and lodged with the consent authority.
2. The lapsing provisions of Section 125 of the Resource Management Act 1991 will apply on expiry of ten years from the date of commencement of this consent.
3. The consent holder shall discharge water from the Eastern Conservation Management Area to the interdune drain between points NZMS 260 M35: 8602-6726 (northern) and NZMS 260 M35: 8571-6533 (southern). Prior to discharge, the water shall have passed through a constructed wetland designed to improve water quality, the details of which shall be included in the Eastern Conservation Management Area management plan.
4. The consent holder shall carry out monthly sampling of the water discharged at NZMS 260 M35: 8571-6533 for the first five years of this discharge commencing, with the frequency and scope of sampling subject to review after five years and under the monitoring component of the Lake Management Plan thereafter. The discharge shall be tested for E coli, concentration of dissolved oxygen, water temperature, natural pH, visual clarity, copper, zinc, total suspended solids turbidity, total nitrate, total phosphate and dissolved reactive phosphate and the results of that testing shall be forwarded to the Canterbury Regional Council and the Te Kohaka o Tuahaitara Trust by the consent holder within 20 working days of receipt.
5. In the event that the Canterbury Regional Council provides notification to the consent holder that it has received and that it supports a formal request from the Te Kohaka o Tuahaitara Trust to alter the point of discharge to flow towards Tūtaepatu Lagoon at or about NZMS 260 M35: 8578-6538, the consent holder shall comply with such request within seven working days of its receipt.
6. Such discharge shall continue until such time as the consent holder is advised by the Canterbury Regional Council that the request has been revoked by the Te Kohaka o Tuahaitara Trust and the point of discharge is to revert to the inter dune drains at or about NZMS 260 M35: 8571-6533. The consent holder shall have seven working days to comply with such notification.
7. Flood peak flow attenuation shall be designed such that the post-development instantaneous peak flow rate does not exceed the pre-development instantaneous peak flow rate in 10% and 1% AEP storm events, for all durations, with the point of compliance being at the discharge from the Eastern Conservation Management Area to the inter dune drains. This shall be determined taking into account only runoff from the site, and without consideration of external flood level influences.

8. The Consent holder shall undertake continuous monitoring of the rate of water discharged at the outfalls from the Eastern Conservation Management Area for the first five years of the commencement of this discharge. In the event that flows above 100 l/s are recorded for more than two weeks, the consent holder shall immediately undertake an assessment of the downstream effects of such discharge on existing land uses. Should such an assessment identify adverse effects that are more than minor to downstream properties, the consent holder shall as soon as is reasonably practicable implement mitigation measures to the satisfaction of the Canterbury Regional Council.

Application CRC062183 to take and divert surface water to create a wetland for a term expiring on 25 August 2021; and

Application CRC062181 to take and use groundwater for a term expiring on 25 August 2041; and

Application CRC 062184 to dam water in the lake and Eastern Conservation Management Area for an unlimited term

On the following terms and conditions:

1. The work shall be carried out in general accordance with the activity details set out in the application and associated assessment of effects, dated December 2005, and lodged with the consent authority.
2. The littoral zone of the lake shall be lined with shingle or other similar material to prevent erosion of the lake shore and resuspension of sediment. This lining shall take place as soon as practicable after the lake is fully excavated. The detail of how the lake is to be lined, and the levels at which it will be lined are to be determined in the Lake Management Plan.
3. The take of groundwater shall not exceed 750 litres per second.

Advice Note

The take of groundwater is not for abstractive purposes. The maximum take of groundwater is a nominal figure calculated on a 1% AEP storm event, which cannot be determined accurately. The expected average take will be about 10-20 litres per second. It is expected this condition could be varied once the actual take is known to provide for an average as well as maximum rate of take.

4. The lapsing provisions of Section 125 of the Resource Management Act 1991 will apply on expiry of ten years from the date of commencement of this consent.
5. (a) Visual inspection of Lake aesthetics shall be undertaken on a two-monthly basis, and shall include inspection for natural colour, presence of toxic or nuisance algal or aquatic plant growth, conspicuous oil or grease films, scums or foams, or floatable or suspended materials excluding those of natural origin.

(b) The results of the inspections, including the name of the person undertaking the inspection, the date and time of sampling, and any interpretation required of the results shall be provided to Canterbury Regional Council, attention: RMA Compliance and Enforcement Manager, within 20 working days of the inspection being carried out.
6. Monthly sampling of ambient lake and Eastern Conservation Management Area water quality shall be undertaken for the first five years that these water bodies are in existence. Water samples will be collected from two locations from the Lake, two locations within the Eastern Conservation Management Area and one from the outlet from the Eastern Conservation Management Area. The location of these sampling points shall be identified in the Lake Management Plan and agreed in writing with the CRC prior to sampling commencing. Water quality shall be monitored for E coli, concentration of dissolved oxygen, water temperature, natural pH, visual clarity, copper, zinc, total suspended solids, turbidity, total nitrate, total phosphate and dissolved reactive phosphate.
7. Within five years of the lake being in existence the consent holder shall prepare a report in conjunction with Waimakariri District Council and submit it to Canterbury Regional Council Attn RMA Compliance and Enforcement Manager which will address the following matters:

- Water quality results as monitored in accordance with Condition 6 above.
 - The likely range of expected and recommended water quality parameters in the future based on such monitoring results.
 - Where necessary and appropriate to achieve Lake Management Plan and Eastern Conservation Management Area Management Plan objectives, an assessment of mitigation options to improve water quality in the lake and/or quality of the discharge from the Eastern Conservation Management Area including life cycle costs, benefits and risks of such options.
 - Where necessary and appropriate recommendations as to any restrictions required for activities in, or uses of, the lake.
8. Notwithstanding Condition 7 the quality of the water in the lake shall in general meet the following criteria:
- It is suitable for the activities and uses for which the lake and its water are proposed in the Lake Management Plan to be used for; and
 - It is generally suitable for secondary contact recreation; and
 - It does not result in persistent seasonal stratification leading to oxygen depletion in the lake; and
 - It does not result in toxic or nuisance algal blooms.
9. The low flow outlet of the lake shall be designed in such a way that during periods of normal dry weather flow, the lake water level is between 1.1m and 1.5m Reduced Level (RL). In the event that future natural groundwater levels are such that inflows are insufficient to maintain a surface outflow at 1.1mRL then the lake water level may be allowed to fall below that level until such time as groundwater levels and inflows recover.
10. The outlets of the lake and the Eastern Conservation Management Area shall be designed to provide for the attenuation requirements of peak flood flow rates from Pegasus township. Above the flood peak flow rate attenuation level, provision shall be made for passage of flood water from the interdune area into the Lake to provide flood storage for extreme events from areas external to Pegasus township.
11. A Lake Management Plan and Eastern Conservation Area Management Plan shall be developed for the site in conjunction with the Waimakariri District Council and submitted to the Canterbury Regional Council, attention: RMA Compliance and Enforcement Manager, prior to commencing the construction of the earthworks for the lake for approval. This Plan shall include performance criteria and monitoring requirements for the lake and Eastern Conservation Management Area and shall show compliance with conditions 5-9 of this consent. A copy shall also be held by the consent holder along with a copy of the consent. Where necessary, this Plan may be reviewed, updated and resubmitted to the Canterbury Regional Council. Where substantive changes result, the Plan shall be resubmitted to the Canterbury Regional Council for approval. These plans shall include lake and Eastern Conservation Management Area performance criteria and monitoring requirements.

Application to the Waimakariri District Council

Pursuant to Sections 102, 104, 104B and 108 of the Resource Management Act, resource consent application R 055800 is granted to undertake earthworks for the purposes of site contouring and construction of a lake at 145, 247, 247B, 271, and 275 Kaiapohia Road, Woodend, and 332, 344, 345, 354, 369, 412, and 416 Gladstone Road, Woodend, being RS 4055, RS 35652, RS 35509, RS 35487, RS 11319, RS 34931, RS 35503, RS 13758, RS 11316, Pt RS 11317, Pt RS 34845, RS 11318, and RS 19096 subject to the following conditions:

THAT pursuant to Section 125 of the Resource Management Act 1991, the consent shall expire 10 years from the date of issue being 25 August 2016.

1. The activity shall be carried out in general accordance with District Plan Map 142.
2. **Standards**
All stages of design and construction shall be in accordance with the Waimakariri District Council Engineering Code of Practice (and the latest amendments) where applicable.

In addition the following standards shall apply.
 - N.Z.S. 4431:1989 – Code of Practice for Earthfill in Residential Development
 - N.Z.S. 4402 Methods of testing soils for civil engineering purposes
 - N.Z.S. 4404: 2004 Land Development and Subdivision Engineering.
 - Liquefaction – Standards set by applicant's Geotechnical Engineers to ensure compliance with the District Plan requirements.
3. **Access**
 - 3.1 No earthworks or site preparation shall take place on the site until the access road is formed to the standard approved under resource consent RC055672.
 - 3.2 Gladstone Road shall not be used for access to the site for site preparation or earthworks.
4. **Earthworks**
 - 4.1 The lake shall be excavated to a maximum depth of 3.50 metres below finished water level.
 - 4.2 Where existing ground levels exceed 4.0m above mean sea level, the ground shall only be shaped to enable future development to occur.
 - 4.3 Fill used to raise ground levels within the Residential 6 or 6A Zones, or in the Business Zones shall only be material sourced from within the site. This condition does not apply to roadfill, trench backfill or drainage material.
 - 4.4 Stockpiles of excavated soil or other material shall be located a minimum of 50 metres away from any neighbouring properties or roads. The height of the stockpiles shall not exceed 6.0 metres above surrounding ground level.

- 4.5 Fill within the Residential 6, 6A or Business 1 Zone shall be installed and compacted to be in compliance with N.Z. Standards 4431 Code of Practice for Earth filling in Residential Development, 4402 (Testing), and 4404. (Land Development and Subdivisional Engineering). An appropriately qualified and experienced Geotechnical Engineer shall provide a certification that the fill has been installed to the required standards. As built plans of the earthworks shall be prepared for submission to the Council on completion.
- 4.6 All allotments within the Residential 6 and 6A and Business 1 Zones shall have a finished ground level of at least 3.50 metres above Mean Sea Level, except where those zones are adjacent to the lake or any conservation area, in which case a gradual transition between the 3.50 metre level and the ground level at the edge of the lake or conservation area shall be provided. An acceptable transition slope shall be determined and certified by an appropriately qualified and experienced Geotechnical Engineer.
- 4.7 Areas exposed by earthworks shall be regressed as soon as practicable after final contouring.
- 4.8 The maximum area subject to earthworks at any time shall not exceed 50 ha provided that the Council may, at its discretion, authorise such maximum area to be in excess of 50 ha if the Applicant has demonstrated that it can maintain effective dust and sediment controls.
- 4.9 The complete lake excavation and complete liquefaction treatment works shall be carried out conjunctively and continuously.
- 4.10 During earthworks and subdivision construction works the consent holder shall take all reasonable measures to protect the integrity of the swales and soakage system from siltation, over compaction and/or other damage. In the event that damage occurs the Consent Holder shall remediate any such damage prior to commissioning of the system.

5. Liquefaction

- 5.1 Earthworks shall include liquefaction mitigation measures that will achieve a maximum settlement of 100mm and a maximum lateral spread of 250mm resulting from a 150 year design earthquake return period. The liquefaction mitigation measures shall be certified by an appropriately qualified and experienced Geotechnical Engineer.
- 5.2 A detailed methodology for liquefaction mitigation shall be submitted to the Council for Engineering approval. The report shall be submitted and the methodology approved prior to the issue of a section 224C Certificate for Stage 2 of the development (as defined in the Application for Subdivision lodged with Waimakariri District Council on 8 February 2006) or prior to the commencement of lake construction whichever is the earlier.
- 5.3 On completion of the earthworks the applicant shall submit to the Council a report containing all test results and analysis, and a statement from the Geotechnical Engineer that the standards set out in 5.1 have been met.

6. Stormwater

- 6.1 All stormwater during construction shall be treated through sediment control works prior to discharging from site. A sediment retention bund shall be installed immediately downstream of the earthworks and along the western

boundary of the Eastern Conservation Management Area. Associated stormwater retention and sediment settlement ponds shall be installed as required to prevent contamination of areas outside the earthworks.

6.2 Flood flow paths of sufficient capacity to accommodate a 10% Annual Exceedance Probability storm shall be incorporated in the earthworks design and construction so that stormwater during a major event is controlled or managed.

6.3 Runoff control and guidance bunds shall be constructed and located as required to ensure run-off does not directly enter natural or existing waterways.

7. Dust

7.1 Water carts shall be available on site at all times. The water carts shall be used as and when required to ensure dust does not create a nuisance off-site.

7.2 Soil stockpiles shall be dampened as required to prevent wind blown dust. Stockpiles shall be shaped to allow access by water carts.

7.3 After completion finished surfaces shall be soiled and grassed as soon as climatic conditions allow.

7.4 No objectionable effect of dust shall be created off site.

7.5 Site works shall cease when winds are of such magnitude as to create a dust nuisance which cannot be appropriately managed within the site.

8. Noise

8.1 At any boundary of the Residential 6 Zone and the Pegasus Rural Zone, other than at the boundary between these two zones, construction noise shall not exceed the recommended limits specified in, and shall be measured in accordance with, the provisions of NZS:6803: P1984 "Measurement and Assessment of Noise from Construction, Maintenance, and Demolition Work". Adjustments and exemptions provided in clause 6 of NZS:6803: P1984 shall apply.

9. Habitat

9.1 The location of earthworks operations shall be varied to allow for the seasonal and long term natural cycles of fauna and flora that occur in the habitats found within the area.

9.2 Areas containing the Four Square Sedge and Matagouri shall be identified, mapped and fenced off prior to earthworks commencing. No earthworks or vegetation clearance shall occur within the fenced off areas. The map showing areas of Four Square Sedge and Matagouri shall be submitted to the Council prior to earthworks commencing.

9.3 Prior to earthworks being undertaken in the "Mudfish Conservation Area", trapping and transfer of Mudfish to a safe site shall occur. Mudfish shall be transferred back into the "Mudfish Conservation Area" when deepening, shaping and completion of the Mudfish Pond has been accomplished. A Management Plan for the development, enhancement and maintenance of the "Mudfish Conservation Area" shall be submitted to the Council prior to earthworks occurring in the "Mudfish Conservation Area".

- 9.4 The interactive streams and formations linking natural systems shall be maintained.

10. Construction Management Plan

- 10.1 A Construction Management Plan shall be prepared and shall detail how all activities to be carried out on the site are to be controlled. The Management Plan shall include maps or plans, proposed traffic routes, the location and size of sediment ponds and overflow channels, the location of storage and parking areas, and a schedule setting out the timing of the various activities.
- 10.2 The applicant shall be responsible for the supervision of the site works.
- 10.3 The Construction Management Plan shall be submitted to the Council for approval prior to earthworks commencing on the site.
- 10.4 This plan shall be updated at least once every year for the duration of this consent, commencing 31 March 2008. A copy of the updated plan shall be provided to the Council.

11. Contractors Environmental Management Plan

- 11.1 A Contractors Environmental Management plan covering the potential effects of all activities to be undertaken on the site shall be prepared and implemented. The Plan shall demonstrate how any potential effects on the environment will be avoided, remedied or mitigated.
- 11.2 The Environmental Management Plans shall be submitted to the Council for approval prior to earthworks commencing on the site.
- 11.3 This plan shall be updated at least once every year for the duration of this consent, commencing 31 March 2008. A copy of the updated plan shall be provided to the Council.

12. Certification

- 12.1 A Chartered Professional Engineer shall, on completion of the works or part of the works, as is required by the above conditions, provide certification that the works have been completed in terms of the plans and resource consent conditions and compliance with the liquefaction requirements of the District Plan.

13. Plans and Specifications

- 13.1 The subdivider shall submit three copies of plans and specifications of all works to the Council for approval. Approval of complying documents shall be given in writing and work should not commence until approval has been received from the Council.
- 13.2 The subdivider shall forward with the engineering plans and specifications copies of any other consents granted in respect of this development, including any consents from Environment Canterbury.
- 13.3 Any subsequent amendments to the plans and specifications shall be submitted to Council for approval.

14. Archeological Sites Protocol

- 14.1 A consulting archaeologist shall monitor all earthmoving activities and shall advise on methods to be undertaken to ensure that adverse effects on archaeological values are avoided, remedied or mitigated. The consent holder shall consult with Te Runanga o Ngai Tahu and Te Ngai Tuahuriri Runanga regarding the appointment of the archaeologist.
- 14.2 The consent holder shall provide the consulting archaeologist, Te Runanga o Ngai Tahu and Te Ngai Tuahuriri Runanga, the following information no less than 25 working days prior to any earth-moving works:
- A schedule of the dates of all significant earthmoving events, their sequence and duration;
 - A summary of all measures being undertaken to ensure that adverse effects on archaeological values are avoided, remedied, reduced or mitigated.
- 14.3 The consent holder shall invite Te Runanga o Ngai Tahu and Te Ngai Tuahuriri Runanga to attend any episode of monitoring or earthmoving activity.
- 14.4 The consent holder shall provide Te Runanga o Ngai Tahu and Te Ngai Tuahuriri Runanga and the New Zealand Historic Places Trust with a copy of all archaeological monitoring and investigation results which are required by the conditions of this consent with an invitation to respond, comment or meet to discuss any results.
- 14.5 The consent holder shall notify the District Council of all information provided to Te Runanga o Ngai Tahu and Te Ngai Tuahuriri Runanga and any responses received. If appropriate, the District Council, with the agreement of the consent holder and Te Runanga o Ngai Tahu and Te Ngai Tuahuriri Runanga, shall convene meetings/hui should any of the information or issues require further discussion.

15. Wahi taonga, wahi tapu and urupa protocol

- 15.1 A representative of Te Ngai Tuahuriri Runanga shall be engaged to be present during earthworks to act as advisor to the developer on identification or protection of wahi tapu, wahi taonga, urupa or historic cultural sites.
- 15.2 The consent holder shall consult with Te Runanga o Ngai Tahu and Te Ngai Tuahuriri Runanga to determine, in accordance with tikanga Maori, if there are any matters of protocol which tangata whenua wish to undertake in relation to the commencement of any earthworks.
- 15.3 The consent holder shall ensure that staff involved with earthmoving activities have received training and are aware of the requirement to monitor earthmoving activities in a way that enables the identification of wahi tapu, wahi taonga, urupa or historic cultural sites. Te Runanga o Ngai Tahu and Te Ngai Tuahuriri Runanga shall be contracted to provide appropriate training to such staff.

- 15.4 Immediately that it becomes apparent that an urupa, wahi tapu, wahi taonga or suspected historical site has been uncovered, earthmoving operations shall stop. The contractor will shut down all machinery or activity immediately, leave the area and advise the consent holder of the occurrence.
- 15.5 In cases other than suspected koiwi tangata (human remains):
- 15.5.1 The representative of Te Ngai Tuahuriri Runanga will be consulted by the consent holder of the site to determine what further actions are appropriate to safeguard the site or its contents, and to avoid, reduce, remedy or mitigate any damage to the site.
- 15.6 Where koiwi tangata (human remains) are suspected:
- 15.6.1 The consent holder will take steps immediately to secure the area in a way that ensures the koiwi tangata are untouched.
- 15.6.2 The consent holder shall notify Te Ngai Tuahuriri Runanga, the Police and the Historic Places Trust that it is suspected koiwi tangata have been uncovered.
- 15.6.3 The consent holder of the site will see that staff are available to meet and guide kaumatua, Police and Historic Places Trust staff to the site, assisting with any requests that they may make.
- 15.6.4 Earthmoving operations in the affected area will remain halted until the kaumatua, the Police and Historic Places Trust staff have marked off the area around the site and have given approval for earthmoving operations to recommence.
- 15.6.5 If the kaumatua are satisfied that the koiwi tangata are of Maori origin the kaumatua will decide what happens to the koiwi tangata and will give their decision to the Police, the archaeologist and the consent holder.

16. **Conditions Auditing**

The Council will audit compliance with the conditions of consent by both site inspections and checking of associated documentation to the extent necessary to ensure the work is completed in accordance with the approved plans and specifications and to the Council's standards. The Council will undertake inspections and checking on an actual costs basis. The subdivider, or their authorised agent, shall notify Council at least one working day prior to commencing various stages of the works. This is to enable audit inspections required by the consent to be performed.

The minimum level of inspection shall be as follows:

Earthworks

- Following stripping of topsoil
- During progress of the earthworks.
- On completion to final levels.

Where repeat inspections are required because of faulty workmanship or work not being ready contrary to the receipt of a notification, such inspections will be carried out

at the current hourly rate for staff time and vehicle running costs for kilometres travelled.

17. Traffic Management

17.1 The subdivider shall submit for approval a Traffic Management Plan detailing traffic control works (including sketch layout and control signs). This plan may be submitted at the time of engineering plan approval and shall be submitted prior to work commencing on or the Main North Road. Management shall be to Level 2, as described in the TNZ & LTSA Code of Practice for Temporary Traffic Management.

18. Works Conditions

Works will not be considered to be completed until conditions 1 to 17 above have been met to the satisfaction of the Waimakariri District Council, at the expense of the applicant.

ADVICE NOTES.

- A) The minimum floor levels for all buildings on site shall be R.L.3.85 metres above Mean Sea Level
- B) All buildings may be subject to a liquefaction assessment submitted at the time building consents are applied for.
- C) Further testing and construction requirements shall be required for the installation of larger structures.
- D) This approval shall not be taken as suitability for subdivision of the land.
- E) This approval is given in the absence of a subdivision consent and rework may be required due to works being carried out prior to subdivision consent and engineering approval. All rework and associated approvals shall be at the applicant's expense.
- F) Engineering approval of liquefaction mitigation method/s by the Council will be approval to proceed with the works proposed. It is not confirmation that the method proposed will achieve compliance with the District Plan. The applicant may be required to carry out additional works necessary to achieve compliance with the District Plan.
- G) Prior to any development works being undertaken in the Residential 6 Zone and Pegasus Rural Zone all appropriate authorities required in accordance with Sections 11 and 12 of the Historic Places Act 1993 should first be obtained from the New Zealand Historic Places Trust.