APPLICANT: LILYBANK STATION HOLDINGS LTD

REPORT OF HAIDEE MCCABE

Consent ID	Description	Table 3 Location	Table 5 Location
CRC071786	To divert, take and use surface water from Station Stream at a maximum rate not exceeding 100 litres per second, and a volume not exceeding 60,480 cubic metres in any period of seven consecutive days and 1,032,000 cubic metres between 1st July and the following 30th June, between map references NZMS 260: I36:132-215 and I36:133-219 for spray irrigation of crops and pasture for grazing stock, (excluding milking dairy cows) and a links type golf course within a command area of 407 hectares, at Lilybank Station, Lilybank Road, Lake Tekapo. An expiry date of 2025 is sought.	High Natural-Character water body	Upstream of Lake Tekapo Outlet

Activity Status

Rule 2, Table 3 WCWARP: The proposed take exceeds the allocation limit of 10% of MALF set for High Natural Character Water Bodies

Rule 6, Table 5 WCWARP: The proposed annual volume is within the allocation limit for "Upstream of Lake Tekapo outlet".

Overall status: Any activity which contravenes any of Rules 2 and 6 is a non-complying activity as per Rule 16

Consent ID	Description
CRC071785	To excavate, construct and maintain a rock infiltration structure and associated pipe works to facilitate the abstraction of water, in the bed of Station Stream between map reference NZMS 260: I36:132-215 and I36:133-219 at Lilybank Station, Lilybank Road, Lake Tekapo. A 35 year duration is sought

Activity Status
TRP: There is no operative regional plan so S77C of the RMA applies, and the activity is **discretionary**. NRRP: The activity does not comply with condition 1 of Rule BLR2 (discharge of sediment) and condition 8 of Rule BLR3 (works in surface water), therefore the activity is **discretionary** under rule BLR8. **Overall status: Discretionary**

1 PROPOSAL

1. Lilybank Station Holdings Ltd (herein referred to as the applicant) farms Lilybank Station at the head of Lake Tekapo, between the Godley and Macaulay Rivers.
2. The applicant applied for CRC071786 and CRC071785 on the 14th December 2006. Application CRC071785 seeks to divert, take and use surface water from Station Stream at a maximum rate of 100 litres per second, for the strategic irrigation of 172 hectares within a command area of 407ha. The irrigation is required for crops and pasture for grazing stock and a links type golf course.
3. It is proposed to abstract water at a continuous rate of 100l/s from Station Stream and then, via a gravity fed piped system, to supply pivot or hard hose gun irrigators. This means that most of the irrigation can occur without the need for power to operate the irrigators or pumps.
4. As an abstraction rate of 100l/s exceeds 10% of the MALF of Station Stream the proposal is a non-complying activity under the WCWARP. However a minimum flow of MALF has been proposed along with four stepped 25l/s incremental flow reductions above this.
5. Application CRC071786 is to excavate, construct and maintain an intake structure and associated pipe works to facilitate the abstraction of water in the bed of Station Stream.
6. The proposed abstraction site is located near the Station Stream gorge outlet and will consist of a buried infiltration gallery. It is proposed to pipe the water out of the stream bed and to the irrigation area.
7. This intake is also for the micro-hydro scheme (same design) that the applicant proposes to run in conjunction with this irrigation system, should it be granted.
8. The micro-hydro scheme applications are currently being processed separately. All written approvals have been received and consent conditions agreed, however final approval has not been obtained at the time of writing this evidence from the Decision Maker. Consequently the land use consent application CRC071786 remains in process for the purposes of this hearing.
9. All land which is gazetted for conservation purposes has been excluded from the proposed irrigation command area.

1.1 Timeline and Summary of Significant Amendments made to the Applications

Timeline	CRC071786	CRC071785
Date of Lodging	14 December 2006	14 December 2006
Notifiable Date	14 December 2006	14 December 2006
Public Notification	29 September 2007	29 September 2007

10. The applications were lodged in December 2006.
11. On the 4th of April 2008, information was provided to ECan notifying a change of ownership and requesting that a minor change be made to CRC071786 in relation to the command area of proposed irrigation land. It was proposed to utilise the same 100l/s from Station Stream and irrigate 172ha but within a larger command area of approximately 435ha. The flowrate, daily and seasonal volume plus

actual hectares of irrigation would not increase. A response to this request was received from ECan on 6 May 2008 indicating that this amendment was accepted as being within the scope of the application.

12. On the 3rd of November 2008, ECan requested further information on both CRC071786 and CRC071785. This information was provided on the 20th January 2009. The volume of water sought, being 1,032,000m3/year, was confirmed as being within the agricultural allocation prescribed by the WCWARP It was also confirmed that this water would be used for crops and pasture for grazing stock as well as for the links golf course.

13. ECAN was also advised that further hydrological and ecological investigations were being undertaken in order to establish a suitable minimum flow, given that more than 10% of MALF had been applied for. The applicant also confirmed that the intake was being designed to meet fish screen requirements.

14. On the 2nd of July 2009, Ecan was advised that the irrigation command area was located outside the DOC conservation area and that the irrigation command area had been pulled back from the Godley River in order to create a significant buffer strip from this river. The total command area was reduced to 407ha.

15. Upon completion of the ecology and hydrology reports and after consultation with Ecan and F&G. the minimum flow of Station Stream was increased to 320l/s and flow-sharing above this minimum flow in stepped reductions of 25l/s was proposed (rather than the 5Y7DLF previously proposed).

16. The land use concept was amended on the 31st of July 2009, so as to be consistent with the land use application for the micro-hydro scheme.

17. On the 10th of August 2009 a further irrigation map was sent to Ecan detailing the amended command area consistent with that which was proposed on the 2nd July 2009.

18. No other changes have been made to the application

2 BACKGROUND INFORMATION

2.1 Farm Details

19. Lilybank Station is located at the head of Lake Tekapo, between the Godley and Macaulay Rivers. The 2,246 ha high country station has some 500 ha of gently sloping land. Approximately 400 ha has been cultivated and the remaining flats and hill country are typical grazed high country land.

20. Lilybank currently runs approximately 5,000 Stock units made up of approximately 70% deer, 25% beef cattle and 5% sheep.

21. Stock at Lilybank are managed according to the season, with a ‘good’ winter allowing stock to be put out onto the hill country. In a ‘poor’ winter, stock can be held back on the flats and sustained with supplement feed.

22. The proposed irrigation scheme will provide security for the production of quality dry matter in the growing season which can then be used for winter feed.

23. The intention of Lilybank is to focus on increasing deer stock units with the proposed irrigation development. There is also the potential that a links type golf course could be developed in the future, however agriculture is the predominant activity.

2.2 Water Source

24. Station Stream is a tributary of the Godley River. It is located in the alpine headwaters of Lake Tekapo, extends for approximately 8 kms and drains the Razor Beck and Sibbald Ranges. For most of its course, Station Stream is confined by steep valley sides and has numerous small streams contributing to its flow. High flows are experienced during summer and in winter, the stream experiences low flows as the system freezes and “locks up”.

25. The ecological study carried out by Dr Dean Olsen, concludes that Station Stream contains habitat for trout spawning and rearing in the lower reaches, koaro and Canterbury galaxias, macro invertebrates and periphyton.

26. Outside of the rocky riverbed, the vegetation surrounding Station Stream is largely comprised of matagouri and tussock grasslands. In the lower reaches, the river braids amongst the matagouri and tussock grasslands and flows sometimes become ephemeral in this section.

27. Station Stream is classified under the WCWARP as a High Natural Character Water Body

28. Station Stream is already modified by a significant culvert crossing located in the stream for the farm access track.

29. In the lower stream reach a land use consent is held by the applicant authorising earthworks in the riverbed for a stop bank. Also within this reach there is a DOC track providing public access to the Godley Valley. Fords and tracks are located throughout the riverbed as Station Stream is braided in this section.

2.3 Mackenzie Irrigation Company shares held

Name: Lilybank Station Holdings Ltd	**Number**
Property Shares	1
Irrigation Shares	172

30. As this is a new consent, MIC shares are required. 172 shares have been acquired by the applicant which equates to an annual volume of 1,032,000 cubic metres (Based on 172ha x 6,000 cubic metres per season)

2.4 Derogation Approval

31. Derogation approval was obtained from Meridian Energy Limited on the 11th of September 2009 as attached in Appendix D

3 COMMENTS ON SUBMISSIONS

32. A summary of submissions is as follows

Resource Consent	**Submissions in support**	**Submission in opposition**	**Neutral**
CRC071786	2	13	1
CRC071785	2	13	1

33. Details of the submissions made in response to all applicants that were publically notified at the same time in 2007 are contained in CRC Report 1, Appendix 5. However an error was found in the original notification and these applications were re-notified on the 29th of September 2007. Many of the submissions are equivalent to submissions made in response to all applications notified in August and as such the summary is considered appropriate. I have reviewed this report and consider it to be an accurate summary of the submissions received.

34. Details of the submissions received that were specific to these applications are as follows:

Submitter	**Issues**	**Support/ neutral/ oppose**
Department of Conservation (DOC)	Deficient in their assessment of the proposed effects on the environment, exceeds the allocation limit for a High Natural character water body under the WCWAP, contrary to Part II of the RMA 1991. authorisation from the Director General of Conservation under the Freshwater Fisheries Regulations 1983	Oppose

Submitter	Issues	Support/ neutral/ oppose
Fish and Game NZ Central South Island	Station Stream exhibits high flows during spring and early summer that provide pools for trout to 'hole up' in. Hydrology not well understood and F & G are not aware of MALF for the stream and cannot know if any allocation is available.	Oppose
Meridian Energy Ltd	If the applicant does not hold adequate MIC shares or complies with tranching, effects on water quality, flow water metering and does not promote sustainable management as per Part II, S104 of RMA.	Oppose
Royal Forest & Bird Protection Society of NZ	Adverse effects have not been adequately investigated and assessed, in particularly effects on natural character of rivers and their ecosystems, effects on water quantity and its effect on species, habitats and ecosystems, effects on flora and fauna, habitats and ecosystems due to changes in water quality	

35. Further information has been provided to F&G by way of the applicant's ecology and hydrology studies during the course of consultation. F&G are aware that this application is outside the 10% allocation limit and hence mitigation measures have been developed in consultation with them to alleviate this

36. Fish and Game have advised that they support the proposed minimum flow of 320L/s, which has been calculated as the MALF for Station Stream, as well as the four stepped 25l/s incremental flow reductions above this minimum flow.

37. This was again clarified recently in an email to F&G dated 26th August 2009 confirming the above mitigation and identifying significant changes made to the application. Further details on the stepped reductions above the minimum flows were provided that same day.

38. The draft ecology and hydrology studies have also been provided to DOC during the course of consultation and the applicant's proposal was clarified in emails to DOC dated the 11th of August 2009 and the 26thof August 2009. Feedback was sought but has not been received at the time of writing this evidence.

39. Derogation approval has been obtained from Meridian Energy Ltd (See Appendix D)

40. A generic submission was received from Te Runanga O Ngai Tahu and consultation has occurred throughout the course of this application, mainly with Paul Horgan. In February 2009 an email was sent to Ngai Tahu with details of the application. I also attempted to arrange a site visit but it did not eventuate at this time.

41. A site visit on the 12th of August 2009 was organised by Mr Buddy Mikaere on behalf of the applicant.

42. Information was emailed to Mr Horgan on the 10th of August 2009 prior to the site visit Furthermore additional information was emailed to Mr Horgan on the 26th and 27th of August 2009 including the minimum flow information and the draft hydrology and ecology reports.

43. The draft FEMP was provided to Ngai Tahu on the 8th of September 2009. Two separate requests were made for feedback but no response has been received at the time of writing this evidence.

44. On the 10th August 2009, Ray Ward-Smith for LINZ, verbally agreed with my suggestion that any relevant LINZ related consents, would be sought upon these consents being granted.

4 CRC030944 - TAKE AND USE CONSENT – ASSEMENT OF ENVIRONMENTAL EFFECTS

45. Prior to the assessment of effects, I wish to clarify and correct some points made in the Section 42A Report 24A under the heading "Description of the Proposed Activity" on pages 3 and 4

46. Paragraph 16 b)-d) sets out an incremental flow reduction proposal. This is not what is being proposed by the Applicant The correct proposal is set out in the evidence of Mr Boraman

47. The Reporting Officer has previously been advised by the applicant that Canada Geese at Lilybank are already actively controlled by a goose shooter and that this arrangement is proposed to continue.

48. The applicant does not propose to extend an open invitation for any game hunters to access Lilybank Station. Hunter access would need to be negotiated directly with the applicant should this be necessary. This matter has potential risk management and issues associated with it which are considered to be beyond the ability of ECan to supervise or control as part of this consent.

49. The irrigation map in Appendix 1 of the S42A report was superseded some time ago and therefore does not identify the Godley River buffer area. I refer you to Appendix A of my evidence for the correct irrigation map

50. The majority of land shown in photographs 6 and 7 in Appendix Two of the Section 42A Report, is not actually within the irrigation command area as stated by the Investigating Officer. .

51. As Station Stream is classified as a high natural character water body, the issues outlined in Policy 32 and set out below have been addressed throughout this Assessment of Effects.

    a) The natural flow variability

    b) Mauri and ecosystems of indigenous species, including mahinga kai species

    c) Indigenous vegetation within and adjacent to the water body

    d) Natural character and landscape

    e) Sites of wahi tapu

    f) Sites of wahi taonga

    g) Habitats including those of invertebrates, birds and fisheries

    h) Passage and spawning areas for trout and salmon

    i) Amenity values, including wild and scenic values

    j) Existing water quality

4.1 Consideration of Alternatives

52. Prior to this application being lodged, other possible water sources were considered.

53. The Godley and Macaulay Rivers, which are located alongside the irrigation areas, are excellent sources of water and the 10% of MALF provision could easily by complied with given their large flow rates. However, given the dynamic nature of these large river systems, intakes would be difficult to maintain as the frequent build ups of gravel would require continual clearance of the intakes.

54. Gallery intakes and shallow groundwater alongside the large rivers were also considered as an option. The reason these were not pursued was because all of the irrigation water would then need to be pumped up hill, requiring power. The supply of electricity to Lilybank Station is unreliable. The electricity supplied is unable to provide three phase power required for the pumps or to allow for single phase power to be converted

55. Therefore diesel would be the only practical source of power for the pumps. However the major obstacle to this option, is that to get to Lilybank Station, all vehicles have to drive through the Macaulay River. Diesel tankers would regularly need to pass through the river which is occasionally impassable. This was considered to be an activity of environmental concern and the importation and use of additional diesel fuel would add to Lilybank's carbon footprint.

56. Consequently the most viable and environmentally sound proposal was to take water from the more stable Station Stream and use gravity to feed the irrigation systems. Minimal power will be required for

the irrigators and there is the possibility that micro-hydro power or other renewable sources can supply this small power requirement.

4.2 Effects on other water users

Effects on other water users	
Comments	This is a new consent application with no other users on Station Stream or known within the Godley and Macaulay Rivers The CRC reporting officer for these applications agrees that effects on other water users are minor.

57. There are no other surface water abstractors on Station Stream.

58. There are also no known users of the Godley and Macaulay Rivers.

59. *Report 3 – Annual Allocations to Activities (Rule 6 Table 5)* acknowledges that the granting of the applications subject to this hearing will not result in the cumulative allocation limit set out in Table 5 being exceeded.

60. The take sits within the area defined as "Upstream of Waitaki Dam, but not upstream of the outlets of the glacial lakes" in Table 5 of the WCWARP. Table 5 sets a cumulative allocation of 275 million cubic metres per year for this area.

61. The proposed take also sits within the area defined as "above Tekapo outlet" in Table 5 of the WCWARP. This table sets a limit of 8 million m^3/year for above the Tekapo outlet. The granting of this consent would be within the "above Tekapo outlet" allocation limit.

62. Meridian Energy Ltd has provided Derogation Approval for the applicant as attached in Appendix D.

63. Given that there are no other users and the volume proposed to be taken is within the Table 5 limits, the effects on other users are considered to be minor.

4.3 Effects on Ecosystem values

Effects on Ecosystem values	
Comments	An allocation limit of 10% of MALF as prescribed by the WCWARP is exceeded, however after considering the mitigation measures proposed, the effects on instream values are considered to be minor. The Investigating Officer concludes that she cannot be certain of the effects on ecosystems The concerns raised in the S42a report have been addressed below.

64. Table 3 of the WCWARP provides an allocation limit rather than a minimum flow for high natural character water bodies. The allocation limit is 10% of the MALF of the water body, as assessed by the Canterbury Regional Council.

65. This application proposes to take more than 10% of the MALF, with the proposed 100l/s equating to approximately 32% of MALF. MALF has been determined as being 312l/s as detailed in Mr Boraman's evidence. This MALF measurement has been agreed to by Mr Stewart on behalf of Ecan and has been rounded up to 320l/s to be conservative.

66. Evidence has been presented by Mr Boraman of Boraman Consultants Ltd, regarding the hydrology of Station Stream and by Dr Olsen of the Cawthron Institute, regarding the ecology of Station Stream.

67. Consultation with Ecan and Fish and Game has resulted in a four stepped 25l/s incremental flow reduction above the minimum flow of 320l/s to ensure Station Stream does not steadily reduce and flat-line near the minimum flow.

68. As stated by Mr Boraman, the risk of Station Stream flat-lining between the flows of 420l/s and 320l/s is low (2.5% of the time). The Reporting Officer also concludes that flat-lining is unlikely and that the stepped reduction in abstraction should mitigate against any potential adverse effects of flat-lining particularly during the shoulder seasons which was the concern.

69. The results of the ecology study undertaken by Dr Olsen conclude that Station Stream has limited fisheries values that any effects of the proposed abstraction on fish species in Station Stream will be less than minor

70. Dr Olsen also considers that the reduction in velocity may be favourable to juvenile salmonoids and invertebrates. And that the magnitude of the take is unlikely to negatively affect the availability of suitable areas for spawning. Furthermore Dr Olsen notes that the high stream flows are a major factor controlling suitability of spawning and juvenile rearing habitat.

71. In terms of native fisheries, Mr Olsen considers that spawning events and significant fish movement coincides with natural freshes when the stream is unlikely to represent a migration barrier. In addition, an overall reduction in velocity may favour Canterbury galaxias over koaro which prefer high water velocities. The quality of habitat of alpine or upland long jaw galaxias (if present) are not considered to be affected by the proposed abstraction.

72. The Reporting Officer refers to Mr Meredith's comments that the hydrological data indicates that there is a low risk of reaching the minimum flow and of any sustained low flow during native fish spawning, which will therefore provide sufficient habitat for native species.

73. This minimum flow and incremental flow reduction proposal has also been provided to DOC and Ngai Tahu along with the supporting ecology and hydrology reports, however at the time of writing this evidence, no feedback has been received from either party.

74. Mr Buddy Mikaere's evidence concludes that given the minimum flow and the proposed incremental reduction regime, that the potential effects on cultural values of Station Stream are less than minor.

75. The applicant is not aware of any sites of wahi tapu, wahi taonga or urupa on Lilybank Station

76. Based on Mr Boraman's evidence, I have determined the effect of the abstraction on the Godley River is negligible given the abstraction rate is only 0.45% of the Godley River flow at the confluence with Station Stream. The annual volume being sought equates to only 0.15% of the Godley River volume. Consequently the effects on the Godley River and furthermore, the headwaters of Lake Tekapo, are considered very minor.

77. A telemetered water level recorder will be installed on Station Stream to enable compliance with the minimum flow and incremental stepped flow reductions. The take itself will also be appropriately metered

78. The intake is proposed to be fish screened in accordance with "Fish Screening: good practice guidelines for Canterbury, NIWA Client Report: CHC2007.092, October 2007".

79. DOC has expressed concerns about increased stock numbers affecting unfenced riparian margins, which may result in disturbance of breeding birds; nest trampling; decreased riparian stability; increased sediment and decreased water quality; reduction in indigenous plant communities and increased weed invasion.

80. The Reporting Officer identifies that fencing off waterways would reduce these potential adverse effects on ecological values.

81. Station Stream and the Godley and Macaulay Rivers are already fenced off from stock in the irrigation command area. As part of the applicant's FEMP (Appendix E), all permanent flowing waterways within the irrigation command area are proposed to be fenced from stock should this application be granted. Furthermore the FEMP has been developed to address water quality matters as detailed in Section 5.5.

82. Fish and Game have expressed concern that the abstraction will affect water quality, reduce dissolved oxygen concentrations and increase water temperature and sedimentation.

83. Dr Olsen considers that the physical characteristics of Station Stream mean that it is extremely unlikely that the dissolved oxygen concentration will reduce to a level significant enough to have an impact on aquatic organisms or that there will be any significant effect on water temperature.

84. The high flow events in Station Stream will not be affected by the abstraction and will continue to flush sediment and assist with dilution.

85. The Reporting Officer concludes that uncertainty remains regarding the effects on aquatic habitat. Dr Olsen's evidence addresses the potential changes in physical habitat relevant to bird feeding and food availability and concludes that with mitigation, the effects are no more than minor.

86. Dr Olsen considers the effects on feeding conditions for relevant bird species and concludes that the minimum flow will maintain availability of suitable feeding habitat for wading birds. In relation to aerial feeders (black fronted tern) Dr Olsen has considered the effect of the take on black-fronted tern but differences in the types of feeding habitats used by terns in the Rangitata and Waimakariri Rivers make it difficult to conclude what the likely consequences of flow reduction on tern feeding habitat in Station Stream will be.

87. Aquatic macroinvertebrates are important to all bird species and Dr Olsen considers that the abstraction is likely to have a less than minor effect on fisheries and a minor effect on macroinvertebrates.

88. The operation of the irrigation system will mean that different irrigators are turned on and shut off at different times so that changes in flow should not be the full 100l/s at any one time.

89. The minimum flow will be telemetered and therefore the effects on flow variability and the associated ecological values should now not be compromised to a more than minor extent. The minimum flow and incremental flow reductions are considered to protect in-stream values. With the ecological issues being addressed by the proposed flow regime, FEMP and riparian fencing, the ecological effects are considered to be minor.

4.4 Effects of inefficient water use

Reasonable and Efficient Use Seasonal Volumes and Land Use	
Land Use	Intensive Pasture
Area to be irrigated (hectares)	172 ha (within a command area of 407ha)
Method of application	Spray
Efficiency of application	80%
Daily application depth	5 mm
Return period	3-8 days
Return period application depth	15-40 mm
Soil profile available water	40mm to 100mm (T Webb)
Effective Irrigation Season Rainfall	390 mm/ha/yr
Seasonal volume required (m^3/year) as per WQN9v2	731,000 m3 (425mm/season)
Volume to be included in Table 5 (WAP) allocation	1,032,000 m3 (600mm/season)
Comments	Stock water is not proposed as part of this application The CRC reporting officer for these applications is not satisfied that the annual volume being applied for represents a reasonable and efficient use of water. The concerns raised in the S42a report have been addressed below.

90. The proposed application depth on the shallower soils in the pivot area is approximately 15mm which and on the heavier soils in the hard hose gun area the application rate is approximately 40mm per return period which is less than 50% of the water holding capacity. I consider this to be an efficient use of water. As per condition WP05.

91. Policy 16 of WCWARP requires all applications for irrigation to meet a reasonable use test. This test includes consideration of the irrigation system operation and management (Policy 16(a)) and an irrigation application efficiency of at least 80% (Policy 16(b)).

92. Policy 16 (c) of the WCWARP defines two alternative approaches for determining appropriate annual volumes for irrigation. These are as follows:

    i) soil-moisture measurements, local rainfall and evapotranspiration modeling for the 1-in-5 year dry season (the year for which seasonal demand is exceeded in 20 percent of years); or

    ii) the difference between peak total seasonal demand as shown in Table A1, Environment Canterbury Report U05/15 and the effective summer rainfall exceeded 80 percent of the time from an approved rainfall site.

93. The first method described is a soil water balance approach, and the second is more commonly referred to as Schedule WQN9v2.

94. In accordance with Policy 16 c (ii) WQN9v2 has determined that 425mm/season/ha is required by the applicant as agreed by Reporting Officer.

95. The applicant has consistently sought an annual volume of 1,032,000 m^3/season. This volume is calculated using the MIC share entitlement of 600mm/hectare/season for 172 shares.

96. This annual volume exceeds WQN9v2.

97. The applicant proposes that no more than 425mm of water will be applied per hectare in anyone season, ensuring efficient watering and that no more than 1,032,000m^3 of water will be used in any one season.

98. This will be achieved by strategic watering. Hard hose irrigation guns are mobile, so once an area of land has received up to 425 mm of water, the guns can be moved to another location. When not required, the pivot irrigators can also be switched off and the available water used by way of the hard hose guns.

99. As the irrigation command are covers some 407 hectares, this ability to strategically water different areas will mean that the amount of water being applied for will be able to be efficiently utilised and not exceed 425mm (as determined by WQN9v2). Strategic watering gives consideration to Policy 16 a.

100. It is not proposed to irrigate more than 172 hectares at any one time.

101. It is therefore considered that Policy 16 can be complied with and that the proposed consent conditions, in particular Condition 2 WP04 as proposed by the applicant, can be complied with.

102. As per Policy 15 the rate of abstraction and annual volume is considered reasonable for the intended use as strategic watering uses water as, when and where, required to avoid wastage and to meet crop demand.

103. Policy 19 of the WCWARP encourages the piping or otherwise sealing of water distribution systems to minimise water losses and meet efficiency and effective use requirements. The proposed system will be completely piped and use gravity to feed a spray irrigation system.

104. Policy 20 of the WCWARP promotes the integration of multiple uses of water. At the time of writing this evidence it is possible that the micro-hydro consent will be granted prior to this hearing. Should both schemes be granted, the same intake and piping system will be utilized to supply water for the generation of electricity and the irrigation.

105. Policy 21 of the WAP requires all water takes to be metered. To ensure that this application is consistent with this policy, the applicant proposes to meter their take. Consideration has been given by Mr Boraman to the integration of the proposed metering conditions for the irrigation application with the micro-hydro consent conditions.

106. Policy 26 – Based on the hydrological investigation conducted by Mr Boraman on Station Stream and taking into account the minimum flow and incremental flow reductions above the minimum flow, the water source is considered to be reliable and is able to meet the reliability criteria set out in Policy 26 a.

107. Due consideration has been given to the WCWARP in terms of efficiency and effective use of water. The effects of inefficient water use are considered minor.

4.5 Effects of the use of water on water quality

Water Quality	
Comments	The CRC reporting officer for these applications is not currently satisfied that effects of water quality on a local or basin wide level are minor. Cumulative effects on water quality have been addressed by Mackenzie Water Resources Limited (MWRL) and are summarized below. Local effects have also been assessed and are addressed below

108. According to the MWRL Water Quality Study, the applicant's property is located within the Upper Catchment surface water catchments. For this property, there are no stream and lake mitigation requirements, so the overall property threshold is based on the proposed output thresholds from the MWRL Study.

109. The calculated nutrient mitigation requirement of the receiving environments determined in the MWRL Study has identified the N and P thresholds for the property. These are shown in the table below.

110. "OVERSEER® has been run by a qualified person to model the N and P outputs from the proposed farming system. The results of the model have been incorporated into the table below. This table shows that the applicant can meet the property thresholds which are the most restrictive.

	Nitrogen Threshold	**Phosphorous Threshold**
MWRL Water Quality Study Property Thresholds	37714	2900
OVERSEER® Outputs	13313	2869

111. The applicant is committed to implementing the "Mandatory Good Agricultural Practices" set out within the Farm Environmental Management Plan (see Appendix E). Implementing these practices will ensure that the OVERSEER® results are validated. This along with ensuring that the property thresholds of the WQS (set out in the table above) are not exceeded the cumulative effects of the use of water for irrigation on water quality are no more than minor.

112. Whilst the applicant is within their property thresholds, the MWRL Study identified that the applicant still has to consider specific on farm effects and the impacts that these activities could have on the local receiving environment. Accordingly, a specifically developed FEMP to identify and implement appropriate mitigation measures.

113. At a workshop held in Twizel in August 2009, the applicants met with Ms Melissa Robson of GHD Limited. A "desk top" on farm risk assessment was undertaken. This assessment is considered to be the "starting point" of the FEMP.

114. The workshop identified potential on-farm risks specific to each farm along with possible mitigation measures. The on-farm risks identified during the desktop risk assessment need to be verified by an appropriately qualified person who will carry out a site visit. It is expected that this will occur, should the application be granted.

115. For Lilybank Station, the desktop risk assessment identified the following potential risks :

- Possible soil compaction due to deer being the main stock type
- Pulling irrigation area back from the Godley River to provide a buffer
- Large deer blocks to discourage fence-walking and wallowing
- Main track through irrigation area to have a culvert for stock crossings
- Troughed water where possible – placement of troughs important as there is the potential for freezing in winter
- Direct drilling
- Permanent flowing waterways – fencing these within the irrigation area
- Temporary flowing waterways – if grazing within the irrigation area and the waterway is flowing, then the waterway shall be temporarily fenced

- Riparian planting at strategic locations within these fenced areas e.g. a ponded area adjacent to the DOC conservation land is proposed to be planted by the applicant.
- Crop rotation

116. The applicant is committed to implementing the FEMP, including the on-farm risk assessment, appropriate mitigation and adhering to the monitoring and auditing requirements before the first exercise of this consent. The FEMP has been proposed as a condition of this consent.

117. Given that the waterbody subject to this application is located within an area of High Natural Character draft mitigation and monitoring conditions have already been indentified and are summarized below:

a) Fencing stock out of permanently flowing waterways within the proposed irrigation area

b) Riparian planting within fenced areas in strategic locations

c) 20m layback from waterways when applying fertiliser within irrigation area

d) Where there is permanent flowing water in the irrigation area, culverts are to be installed for stock crossings and the main track.

e) Irrigation buffer from the Godley River has been increased as per the location plan

f) An Irrigation buffer of 20-30m from the Macaulay River bed is to be created.

118. An irrigation plan has not been provided as this cannot be finalized unless and until a consent is issued. In any event both consent condition WP05 and the FEMP propose that less than 50% of the PAW will be applied, which should address concerns in the absence of an irrigation plan.

119. Contamination of shallow groundwater will be further considered when finalising the FEMP, however as excess water cannot be applied (WP05) therefore contamination of groundwater is not expected.

120. As part of the proposed FEMP, audits, measures and actions in the case of non-compliance are proposed, including water quality sampling to detect change once the FERA has been completed as part of finalizing the FEMP. Baseline sampling has commenced so there is a starting point and this will assist with setting triggers to ensure the effects on water quality are no more than minor.

121. In Section 5.3 of the Section 42A Report on Water Quality the Investigating Officer considered that several water quality related ecological issues could be addressed by the proposed FEMP and riparian fencing and concluded that with the use of these measures, the ecological effects could be considered minor.

122. Given that the N and P thresholds from the MWRL Study can be met and the applicant is committed to addressing on-farm risks through the implementation of the FEMP, the effects of the use of water on water quality for both the local receiving environment and cumulative effects are considered to be minor.

4.6 Effects on Landscape

Effects on Landscape	
Comments	Landscape effects have been addressed by UWAG's Landscape Architect, Mr Andrew Craig, who considers that this proposal will have a minor effect on landscape values. The CRC Reporting Officer for these applications considers that the effects may be more than minor if irrigation occurs on the foothills. This concern is addressed below.

123. Mr Andrew Craig is a landscape architect who is providing general and specific recommendations on behalf of UWAG clients to this hearing. His conclusions reflect that the general effects on the Mackenzie landscape of these further applications within the basin will be significantly less than minor. I adopt his recommendations to the committee. In terms of the specific placement of the irrigation structures associated with this application, I confirm the following:

a) The intake is located in the gorge section of Station Stream and will therefore not be visible to people using the public 4WD track

b) The area to be irrigated is located on either side of a remote public access track. The track itself will not be affected by the irrigation development.

c) The area proposed to be irrigated is land that has already been cultivated and that is already part of a modified rural environment..Fencing and cultivation have already occurred. .

d) The foothill area is already green due to cultivation.

e) An sealed air-strip is located alongside the irrigation area on the land between the Macaulay River and lodge.

f) It is proposed to use hard hose guns to irrigate the foothill area. Centre pivots would be impractical on the foothills given the extensive deer fencing and the need to avoid existing infrastructure such as the public 4WD track, waterways and deer sheds.

g) Hard hose guns are much smaller in size than centre pivots and are not a permanent fixture. Consequently they are only placed in the irrigated areas during the irrigation season and would be stored under cover outside the irrigation season

h) If developed, the golf course on the foothills would be a "links type golf course" as the agricultural activities are intended to be continued in this land area even with a golf course.

i) A buffer strip of approximately 500mtrs from the Godley River is proposed.

j) The buffer strip from the closest braids of the Macaulay River is 20-30mtrs, however it will be approximately 600mtrs from the main river channel

4.7 Effects on People, Communities and Amenity Values

Effects on People, Communities and Amenity Values	
Comments	The CRC reporting officer for these applications agrees that effects on people, communities and amenity are minor.

124. Given this application exceeds the allocation limit established by Table 3 for High Natural Character Water Bodies, the applicant has investigated and proposed mitigation to protect the instream values as detailed in Section 5.3. This minimum flow has been set to protect in-stream values and is also considered to adequately protect people, community and amenity values within the rivers relevant to this application.

125. The proposed activities will occur in a rural setting, where the dominant land use is pastoral farming. Furthermore, the proposed activities occur on private farmland and will not affect public access as raised by the Reporting Officer. The irrigation system is being developed around this public access and farm track. As such, the use of water is unlikely to adversely affect amenity values.

126. The WCWARP sets an annual allocation "cap" for agricultural and horticultural activities within defined areas (Table 5) which in Section 5.1 is considered to be met. The applicant has proposed an annual allocation limit for their own resource consents for the use of water.

127. Water quality is addressed in Section 5.4 in terms of cumulative and individually with the FEMP and landscape has been considered with Section 5.5

128. Given the applicant's commitment to ensuring efficient use of water on their property and the mitigation measures that have been proposed to protect in-stream values and other users, it is considered that any effects on people, communities and amenity will be minor as is acknowledged by the Reporting Officer.

4.8 Effects on Tangata Whenua Values

Effects on Tangata Whenua	
Comments	The CRC reporting officer for these applications considers the effects on Tangata Whenua are uncertain and may therefore be more than minor

129. Te Runanga O Ngai Tahu submitted on all applications in the catchment, seeking that all applications be declined.

130. The primary reasons given for this, were that the applications were considered to be inconsistent with the policies and objectives of the WCWARP, and also at odds with the cultural objectives of the RMA.

131. Given this application is not within the allocation limit for High Natural Character Water Bodies under the WCWARP, extensive consultation has occurred with Ngai Tahu as set out in Section 3 of my evidence.

132. It is acknowledged that Te Runanga O Ngai Tahu has a significant relationship with the Waitaki Catchment including the headwaters of Lake Tekapo and in order to assist with this aspect of this application, Mr Mikaere was engaged to address cultural matters on behalf of the applicant.

133. Mr Mikaere's evidence specifically addresses cultural matters in relation to this application and considers that cultural values and cultural issues are addressed and either protected or properly mitigated. Water quality matters, advised by Ngai Tahu as being the most significant issue arising from irrigation above Lake Tekapo, are also considered and addressed in the water quality Section 5.5 and evidence of Mr Mikaere.

134. Based on the evidence of Mr Mikaere and given the mitigation measures proposed by the applicant to ensure that the potential effects on the environment are minor, it is considered that effects on tangata whenua values have been properly addressed.

5 CRC071785 LAND USE CONSENT - ASSESSMENT OF ENVIRONMENTAL EFFECTS

135. As a result of the finalising of the micro-hydro consent conditions for the intake land use consent, - which is exactly the same activity as proposed by this application - the consent conditions have been amended to ensure consistency. The Reporting Officer is aware of this also.

5.1 Effects on flood carrying capacity and bank erosion

136. The intake is proposed to consist of an infiltration intake, buried up to approximately 2 metres below stream-bed level; any excavated materials will be replaced to bring the area back to bed level. The intake should be installed within 1-2 days

137. The intake is proposed to be located in the stream-bed but should have no effect on the flowing water upon completion of construction, as it will be buried.

138. The proposed intake structure should not create any erosion or increase bank instability to other banks in the vicinity given the buried and unobtrusive nature of the proposed intake.

139. The main body of flowing water may be disturbed upon installation of the intake and the stream may need to be temporarily diverted around the intake area for a short distance (less than 50mtrs) where the slotted pipe is being installed. On completion of construction, the stream will be reinstated over the infiltration gallery.

140. The culvert located approximately 600mtrs downstream of the intake location, is only used by the applicant however it is not considered to be affected by the activities proposed.

141. Proposed condition 7 was unpractical and has been amended to mean materials other than those excavated during the construction process.

142. Given this amendment, any effects on flood carrying capacity and bank erosion of Station Stream are considered to be minor given the mitigation proposed

5.2 Effects on water quality and instream values

143. Works at the intake location will be undertaken during the initial construction and on an as needed basis for such activities as maintenance and replacement, particularly at the beginning of the irrigation season.

144. It is acknowledged that the in-stream works can cause a temporary discolouration of the water and particularly from the perspective of the aquatic ecosystems that may be present in the stream; such sedimentation can have an impact at sensitive times such as spawning and work at this time will therefore be avoided.

145. The most common approach is to avoid undertaking works within flowing water, thereby avoiding the possibility of increasing levels of suspended sediment contained within the waterway. In this instance it is simply not practicable for the works associated with the intake to occur in an area where water is not flowing.

146. However it is proposed that the stream be temporarily diverted around where the intake is to be constructed so that works does not occur in continuously flowing water and therefore continuously create increased sediment levels.

147. Condition 6 a) was amended to include March given the information provided by Dr Olsen that spawning of trout and native fish should not occur during this month . Condition 6 b) was amended to reflect the Reporting Officer's intention of maintenance work and 6 c) was added to reflect that Condition 6 was only relevant to works in flowing water.

148. Given the effects that have been considered by Dr and the mitigation measures subsequently proposed, the effects on water quality and instream values are able to be effectively mitigated to the extent that they can be considered minor.

5.3 Effects on amenity, people, communities and Tangata Whenua values

149. The proposed intake is located at the gorge section of Station Stream and is not visible to people using the public 4WD track.

150. The intake will be inconspicuous as it is located under the river bed and covered by rock material. The water will be piped. After the initial construction, the disturbed area should re-vegetate and in time blend back into the surroundings.

151. In relation to Tangata Whenua values, an accidental recovery protocol has already been proposed by the applicant. Consultation has occurred with Ngai Tahu and the land use consent has not been raised as a concern

152. Mr Mikaere's evidence specifically addresses cultural matters in relation to Lilybank Station and considers that cultural values and cultural issues are appropriately addressed.

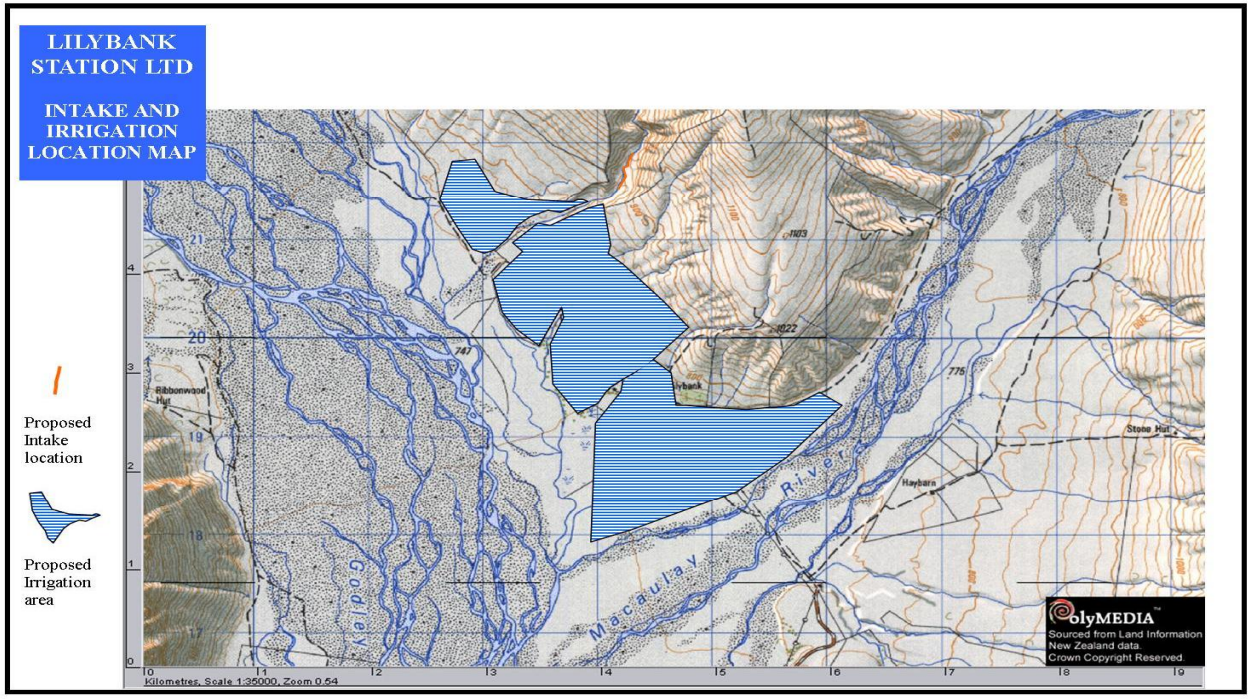
153. As stated by the Reporting Officer, the effects on amenity values are considered to be minor.

6 CONCLUSION

154. As a water body that has been classified as being of High Natural Character, Station Stream has been extensively studied and alternative water sources for the proposed activity have been thoroughly explored.

155. The high level of scientific knowledge about both the water source, the area proposed to be irrigated and the potential effects on water quality, has resulted in a set of proposed conditions that are designed to ensure that any physical effects arising from the proposed activities can properly be assessed as being no more than minor. Cultural, landscape and amenity issues have also been fully explored and appropriate mitigation measures proposed so as to ensure that again, any adverse effects are no more than minor.

APPENDIX A: COMMAND AREA OF THE PROPOSED IRRIGATION DEVELOPMENT AT LILYBANK

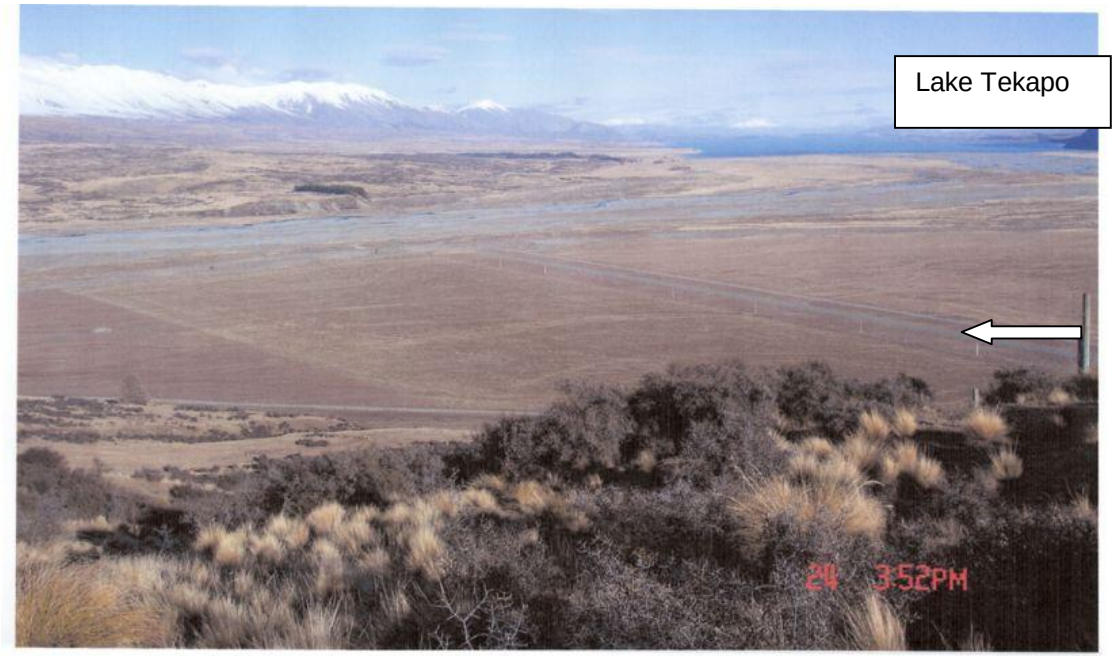


APPENDIX B:

Photo A: Area of proposed irrigation development

Photo 2: Location of proposed intake

Photo 3: Area of proposed irrigation development looking towards the Macaulay River, with Lake Tekapo in the distance. The arrow indicates the public access road and the airstrip



APPENDIX C: PROPOSED CONDITIONS

CRC Proposed conditions used with track changes

Please note that conditions relating to water quality and FEMP are still to be added

CRC071786 – To take and use surface water

1. *WP01*
   Water shall only be taken from Station Stream, at surface water abstraction point I36/0004, between map references NZMS 260 I36:132-215 and I36:133-219, at a maximum rate of 100 litres per second, with a daily volume not exceeding 8,640 cubic metres, a volume not exceeding ~~60,480~~ 86,400 cubic metres in any period of ten consecutive days, and with a total volume not exceeding ~~731,000~~ 1,032,000 cubic metres between 1st July and the following 30th June.
2. *WP04*
   Water shall be used only for: (i) spray irrigation of crops and pasture for grazing sheep, beef cattle, deer or non-milking dairy cows; and (ii) irrigation of a links style golf course; ~~such that a combined total of no more than 172 hectares is irrigated~~ not exceeding an application of 425mm/season on any area of land within the 407 hectares, as described in the application, on the area of land shown in attached plan CRC071786, which forms part of this consent.
   Insert tranching regime from Derogation Approval
3. *WP05 Avoid wastage of water*
4. *WP06 Backflow prevention*
5. *WP07*
   ~~Whenever the flow (expressed in litres per second) in Station Stream as estimated by the Canterbury Regional Council from measurements at the Station Stream recorder site, map reference NZMS 260 I36:1259-2119:~~

   ~~a) is equal or greater than 420 litres per second, the maximum rate at which water is taken shall not exceed 100 litres per second;~~
   ~~b) is equal to or less than 395 litres per second, and greater than 370 litres per second, the maximum rate at which water is taken shall not exceed 75 litres per second;~~
   ~~c) is equal to or less than 370 litres per second, and greater than 345 litres per second, the maximum rate at which water is taken shall not exceed 50 litres per second;~~
   ~~d) is equal to or less than 345 litres per second, and greater than 320 litre per second, the maximum rate at which water is taken shall not exceed 25 litres per second;~~
   e) ~~is equal to or less than 320 litres per second, abstraction shall cease~~.
   Refer to the evidence of Mr Boraman for amended condition

6. *Install and maintain minimum flow recorder site – Station Stream, NZMS 260 I36:1259-2119*
7. *ME01 Installation of accessible straight pipeME04 refers to straight pipe?*
8. *ME02 Cease abstraction for CRC to measure flows in Station Stream*
9. *ME04 Metering condition* Datalogger required as per MIC/MEL conditions
10. *ME05 Certification of recording device*
11. *AD03 Review*
12. *AD04 Lapse*

CRC071785

Scope

1. a) Works in the bed and banks of Station Stream shall be limited to installation and maintenance of a submerged gallery intake, irrigation supply pipeline, and erosion protection, including:
   i. excavation of a trench up to ~~1~~ 2 metres wide, 20 metres long, and 3 metres deep; and
   ii. installation of a 700mm diameter pipe, with a maximum of 8mm slots (submerged gallery intake) and an irrigation supply pipeline; and
   iii. installation and maintenance of rip rap protection; and
   iv. maintenance of the submerged gallery intake to ensure compliance with fish exclusion standards described in the *Fish Screening Good Practice Guidelines for Canterbury, NIWA Client Report: CHC2007.092, October 2007,* including maintenance of a 2 metre depth of graded gravels over the submerged gallery intake.

   b) The pipeline submerged gallery intake described in 1(a) shall be buried to a minimum depth of 2 metres below lowest bed level.

Location

2. Works shall only be carried out within the bed and banks of Station Stream between map references NZMS 260 I36:1322-2166 and I36:13~~3~~22-219~~5~~8, as shown on attached plan CRC071785.

Works/Construction

3. Prior to commencing excavation, a copy of this resource consent shall be given to all persons undertaking activities authorised by this consent.
4. The Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager shall be notified not less than 48 hours prior to the commencement of works.
5. Works described in Condition 1 shall take no longer than ~~a~~ two days to complete.
6. (a) Works described in Condition 1(a) shall only occur in January, ~~or~~ February or March of any year.
   (b) Works described in Condition 1~~(b)~~ to maintain a submerged gallery intake and associated pipe shall only occur when there are naturally high levels of sediment in Station Stream, following a high flow event.

   (c) Works described in Condition 1 that are not located within flowing water, are excluded from (a) and (b) of Condition 6

7. Material used for construction of the gallery and associated pipeworks, excluding those excavated during constructions and restored to site, shall not be sourced from the bed and banks of Station Stream.
8. ~~*LU16 Not in flowing water*~~
9. *LU22 Storage of fuel*
10. *LU23 Minimise adverse effects on a variety of values*
11. Machinery shall be free of plants and plant seeds prior to use in the riverbed.
12. To prevent the spread of Didymo or any other aquatic pest, the consent holder shall ensure that activities authorised by this consent are undertaken in accordance with the Biosecurity New Zealand's hygiene procedures.
    Note: You can access the most current version of these procedures from the Biosecurity New Zealand website http://www.biosecurity.govt.nz or Environment Canterbury Customer Services

13. Excavation shall not occur within 100 metres of birds, which are nesting or rearing their young in the bed of the river.

Erosion Protection, Sediment Control and Flood Capacity

14. All practicable measures shall be undertaken to prevent the discharge of sediment to Station Stream arising from the works.
15. All practicable measures shall be undertaken to ensure that works do not deflect floodwaters into the berm.
16. *LU011 No erosion of bed and banks – ephemeral streams*
17. The proposed works shall not have any adverse effects on the flood carrying capacity of Station Stream.

Accidental Discovery Protocol

18. *LU09 Arowhenua Runanga and Waihao Runanga*

Upon Completion

19. *LU27 Remove spoil and waste material*
20. All disturbed areas on the riverbank shall be stabilised and re-vegetated with suitable indigenous species following completion of works.

Administration

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

APPENDIX D :DEROGATION APPROVAL

APPENDIX E – DRAFT FARM ENVIRONMENTAL MANAGEMENT PLAN