
RESOURCE CONSENT CRC120610

Pursuant to Section 104 of the Resource Management Act 1991

The Canterbury Regional Council (known as Environment Canterbury)

GRANTS TO:	Waimakariri Irrigation Limited
A WATER PERMIT (S14):	To dam up to 8.2 million cubic metres of water.
COMMENCEMENT DATE:	28 Aug 2020
DATE CONSENT NUMBER ISSUED:	28 Aug 2020
EXPIRY DATE:	28 Aug 2055
LOCATION:	Wrights Road, OXFORD

SUBJECT TO THE FOLLOWING CONDITIONS:

Limits

- 1 Water shall be diverted from the Waimakariri Irrigation Limited Buffer Pond on Lot 1 DP 3020 at map reference Topo BW22:3399-9685 and dammed only on land parcel Lot 1 DP 27020 at or about map reference Topo BW22:3480-9720, located on the corner of Wrights Road and Dixons Road, Burnt Hill, and as shown on **Plan CRC120610A**, which forms part of this consent.
- 2 Except as required by the subsequent conditions, the Waimakariri Irrigation Storage Ponds shall be constructed and used in accordance with the information submitted with the application and as amended through the hearing of the applications:
 - a. in a joint hearing between the Canterbury Regional Council and the Waimakariri District Council;
 - b. in the hearing of an appeal to the Environment Court, with a final decision of the Environment Court being issued on 28 August 2020

and including:

- c. the document entitled Assessment of Environmental Effects for the Construction and use of Wrights Road Storage Ponds, prepared for Waimakariri Irrigation Limited by Pattle Delamore Partners, dated November 2013;
- d. the report entitled Waimakariri Irrigation Ponds - Design Report, prepared for Waimakariri Irrigation Limited by Damwatch (Issue 4 dated 9 December 2015); including Construction Drawings (*Design Report*); and Technical Specifications (Issue 5) (*Technical Specifications*), and in each case inclusive of any approved amendments or updates.

Maximum volume and water depth

- 3 The maximum volume of water dammed within the ponds at any one time shall not exceed 8.2 million cubic metres.
- 4 The depth of water in the dam shall not exceed 11 metres measured from natural ground level, and at all times the Consent Holder shall ensure a freeboard of 1.3 metres is available in all storage ponds. The full supply level of storage pond 1 is RL226.70 m and that of storage pond 2 is RL 223.00 m (based on the Lyttelton Vertical Datum (LVD-37) with a level of +0.0 mRL).

Review and certification

- 5 Where a condition of this consent refers to a *review or certification by an independent certifier*, unless the context otherwise requires, that means:
- the reviewer or certifier shall be a suitably qualified and registered Chartered Professional Engineer and who, where the review or certification relates to matters of dam design, construction, or the preparation and peer review of documentation required for large dams, has a minimum of 10 years' experience in those activities and is a *Category A Recognised Engineer* for the purposes of the *New Zealand Society on Large Dams (NZSOLD) New Zealand Dam Safety Guidelines 2015 (NZSOLD Guidelines)*;
 - and the reviewer or certifier shall be independent of the consent holder, dam designers and construction contractors;
 - the reviewer or certifier shall be approved by the Manager, RMA Monitoring and Compliance, Canterbury Regional Council;
 - the Consent Holder is responsible for appointing the reviewer or certifier and all costs of certification;
 - the Consent Holder shall implement any documentation changes and remedial actions recommended by the reviewer or certifier; and
 - the Consent Holder shall provide to the Manager, RMA Monitoring and Compliance, Canterbury Regional Council, written certification from the reviewer or certifier that the documentation, design, system or processes subject of the respective consent condition(s) are in accordance with good engineering practice and are consistent with the *NZSOLD Guidelines* including any amendment or update current at the time of certification and the documents listed in condition 2.

Advisory note: When determining the independent certifier for the purposes of this consent, preference shall be given to, if available, engaging one of the Peer Reviewers involved in the original consent application review on the basis of familiarity with the project.

PRE - CONSTRUCTION**Construction management plan**

- 6 At least three months prior to construction commencing on site, the Consent Holder shall provide to the Manager, RMA Monitoring and Compliance Canterbury Regional Council for approval, a final Waimakariri Irrigation Storage Ponds Construction Management Plan (CMP). The CMP shall:
- a. be prepared by a suitably qualified and experienced person(s); and
 - b. contain certification by a suitably qualified and experienced independent person(s) that the CMP meets the objectives and performance standards set out in conditions 10 and 11.
- 7 Construction work and associated activities shall not commence at the site until the CMP has been accepted by the Manager, RMA Monitoring and Compliance, Canterbury Regional Council and the Consent Holder has received written notice of acceptance and the first meeting is held with the Community Liaison Group CLG).
- 8 Should the Manager, RMA Monitoring and Compliance, Canterbury Regional Council refuse to accept the CMP in accordance with these conditions, the Consent Holder shall provide a revised CMP to the Canterbury Regional Council as soon as is practicable.
- 9 All activities authorised under this consent shall be undertaken in accordance with the CMP, which will be monitored by WDC and Canterbury Regional Council collaboratively in accordance with their areas of responsibility

Construction objectives for CMP

- 10 The objectives for the CMP for all construction activities managed under it are to:
- a. ensure that the construction activities achieve compliance with the conditions of consent for these activities;
 - b. minimise the release of sediment, either to water or to air, during construction activities;
 - c. provide a method to ensure that the Consent Holder's contractors and agents implement the CMP, so that compliance with conditions of consent for construction effects can be achieved;
 - d. ensure all construction is undertaken in accordance with methods that provide for a review by an independent expert (as determined in accordance with the *NZSOLD Guidelines* in dam quality assurance) of the overall construction methodology;
 - e. ensure a copy of the current CMP is available on-site at all times;
 - f. minimise the extent or time that areas of the site are disturbed; and
 - g. integrate good environmental practice into construction activities.

Performance standards for CMP

- 11 The CMP shall include, but not be limited to:
- a. the steps that will be undertaken during construction to ensure the *Waimakariri Irrigation Ponds - Technical Specification* and any approved amendments or updates, and the conditions of this consent are complied with;

- b. methods of the works, including but not limited to, the staging of the works, the site layout plan and procedures to be used;
- c. methods that are consistent with the dam being managed to High PIC standards under the *NZSOLD Guidelines* including any amendments;
- d. details of the interrelationship with the quality assurance programme, including the review by an independent expert in dam quality assurance of construction processes as required by conditions 12 to 18 of this consent;
- e. details on how compliance with the Worksafe Good Practice Guideline for Excavation Safety (July 2016) will be achieved;
- f. details of measures to be identified and implemented to prevent unauthorised access to and/or the unauthorised deposition of material into the excavated areas;
- g. details of how the method for construction for the pipe trenches meets health and safety standards; and
- h. details addressing the need to avoid rocks puncturing the liner or incorporation of that information into Technical Specification, Section 4.4.

Quality Assurance and Quality Control Plan

- 12 Prior to construction activities commencing on the site the Consent Holder must prepare a Quality Assurance and Quality Control Plan to be incorporated into the Construction Management Plan.
- 13 The Consent Holder shall appoint a suitably qualified and registered Chartered Professional Engineer who has a minimum of 10 years' experience in dam design, construction, and the preparation and peer review of documentation required for large dams, and who is a recognised *Category A Recognised Engineer* for the purposes of the *NZSOLD Guidelines* to act as an independent certifier to ensure the Quality Assurance and Quality Control Plan is being complied with at all times (the *Quality Assurance Reviewer*).
- 14 Construction work shall not commence at the site until the Quality Assurance and Quality Control Plan has been accepted by the Manager, RMA Monitoring and Compliance, Canterbury Regional Council and that acceptance advised by notice in writing to the Consent Holder.
- 15 Should the Manager, RMA Monitoring and Compliance, Canterbury Regional Council refuse to accept the Quality Assurance and Quality Control Plan in accordance with these conditions, the Consent Holder shall provide a revised Quality Assurance and Quality Control Plan to the Canterbury Regional Council for acceptance as soon as is practicable.
- 16 All construction activities authorised under this consent shall be undertaken in accordance with the Quality Assurance and Quality Control Plan.

Objectives of the Quality Assurance and Control Plan

- 17 The objectives of the Quality Assurance and Quality Control Plan shall be to:
 - a. ensure that the construction activities achieve compliance with the conditions of consent for these activities;

- b. ensure that the relevant parts of the Technical Specification are complied with at all times during construction;
- c. provide for:
 - i. quality planning – as to which quality standards are relevant to the construction process throughout the duration of construction;
 - ii. quality assurance – as to evaluating the construction undertaken on a regular basis to provide confidence that the project will satisfy the relevant quality standards; and
 - iii. quality control – as to monitoring specific information as necessary to enable determination of compliance with the relevant quality standards as set out in the Technical Specification and the conditions of this consent.

Performance standards for the Quality Assurance and Quality Control Plan

- 18 The Quality Assurance and Quality Control Plan shall include, but not be limited to:
- a. ensuring the embankment construction meets the requirements of section 4.1.3 of the Technical Specification (including all associated piping and control structures) and the conditions of this consent;
 - b. detail on how the HDPE geomembrane liner complies with the Technical Specification, the conditions of this consent and all management plans, including:
 - i. the QA/QC Manual and summary inspection test and test plan required by section 6.6.2 of the Technical Specification;
 - ii. the results of manufacturer and external laboratory testing of the geomembrane liner and the adequacy of testing to ensure the properties set out in section 6.5 of the Technical Specifications;
 - iii. the accurate identification of enhanced geomembrane liner rolls for pond corner areas set out in section 6.9.5 of the Technical Specifications;
 - iv. the installation of the geomembrane liner and test coupons as required by the Technical Specification and the conditions of this consent; and
 - v. methods for ensuring the on-going monitoring complies with the Technical Specification and the conditions of this consent;

and

- c. procedures that ensure the Review by the Quality Assurance Reviewer of all information relating to construction that is to be received under the conditions of this consent.

CONSTRUCTION PRE-COMMISSION

Embankment construction

- 19 The Consent Holder shall ensure that the Embankments are constructed in accordance with the Technical Specification including the requirement that a 500mm layer of silt shall be placed on the upstream face of the fuse plug as shown on drawing WIL1123/30/147.
- 20 The Consent Holder shall engage the Quality Assurance Reviewer to observe on site that the works are undertaken in accordance with the Quality Assurance and Quality Control Plan, including compliance with the Technical Specification.

Control system

- 21 The dam shall be constructed with a control system installed that enables automatic detection of embankment structural deformation that could lead to an embankment integrity issue, and which includes:
 - a. a Time Domain Reflectometry (TDR) system as detailed in section 9.3 of the Technical Specification that includes:
 - i. a low-level alert (where a deformed cable indicates a small movement); and
 - ii. a high-level alert (where a sheared cable may be indicative of possible large magnitude slope failure),

and which has been certified by an independent certifier as being capable of and installed to enable the provision of the warnings set out in conditions 21(a)(i) and (ii). Such certification shall be provided to the Manager, RMA Monitoring and Compliance, Canterbury Regional Council at least three months prior to the installation of the system;

or

- b. an alternative system that is certified by an independent certifier as being capable of providing equivalent warnings to that set out in conditions 21(a)(i) and (ii). Such certification shall be provided to the Manager, RMA Monitoring and Compliance, Canterbury Regional Council at least three months prior to the installation of the equivalent system.

Reporting by Quality Assurance Reviewer

- 22 At 3 monthly intervals following the commencement of construction works at the site until commissioning of the dam the Quality Assurance Reviewer shall provide a report to the Consent Holder, the Dam Designer, the Contractor and the Manager, RMA Monitoring and Compliance Canterbury Regional Council, in accordance with the Quality Assurance and Quality Control Plan that summarises the results of all information received, the supervision of the Quality Assurance **on-site** and an opinion on compliance on-site with the Technical Specification and the conditions of this consent.

Water Storage Commissioning Plan

- 23 At least three months prior to commissioning the Water Storage Ponds (being the first filling of water), the Consent Holder shall provide to the Manager, RMA Monitoring and Compliance Canterbury Regional Council a Water Storage Commissioning Plan. The Water Storage Commissioning Plan shall:

- a. be prepared by a suitably qualified and experienced person(s); and
- b. contain certification by a suitably qualified and experienced person(s) that the Water Storage Commissioning Plan meets the objectives and performance standards set out in conditions 24 and 25.

Water Storage Commissioning Plan objectives

- 24 The objectives of the Water Storage Commissioning Plan shall be to:
- a. minimise risks from the initial filling of the ponds, in accordance with *NZSOLD Guidelines* including any amendments or updates; and
 - b. confirm that the infrastructure required for the management of water on site (including control structures and systems, pumps, and monitoring systems) meets the requirements of the Technical Specification.

Water Storage Commissioning Plan performance standards

- 25 The Water Storage Commissioning Plan shall include, but not be limited to:
- a. a description of the water management infrastructure (including that as required by the Technical Specification);
 - b. an outline of the procedures that are to be followed during the commissioning and testing of control structures and systems, pumps, and monitoring systems; and
 - c. detail on the required surveillance of the ponds during commissioning.
- 26 Following commissioning, the independent certifier who provided the certification for the purposes of condition 23(b) shall provide a further certificate to the Manager, RMA Monitoring and Compliance Canterbury Regional Council confirming that the infrastructure required for the management of water has performed in accordance with the Water Storage Commissioning Plan including the Technical Specification.

Dam Safety Management System

- 27 The Consent Holder shall engage a suitably qualified and registered Chartered Professional Engineer who:
- a. has a minimum of 10 years' experience in: dam design; construction; and the preparation and peer review of documentation required for large dams; and
 - b. is a *Category A Recognised Engineer* for the purposes of the *NZSOLD Guidelines*;
- to prepare a documented Dam Safety Management System (DSMS) in accordance with the *NZSOLD Guidelines* including any updates or amendments. This includes the Dam Safety Management Plan (DSMP) the objectives of which shall be to minimise risks from the ongoing operation of the ponds.
- 28 The documented DSMP shall include and not be limited to the following components, in accordance with the *NZSOLD Guidelines* including any amendments or updates:
- a. governance and people;

- b. dam and reservoir operation and maintenance (including health and safety);
- c. surveillance and control systems (including those required for both water management and dam safety);
- d. monitoring the condition and performance of the geomembrane liner;
- e. appurtenant Structures and Gate and Valve Systems;
- f. intermediate dam safety reviews (conducted annually);
- g. comprehensive dam safety reviews (conducted every 5 years);
- h. special inspections and dam safety reviews;
- i. emergency preparedness including emergency equipment and material supplies (and including the relationship between the DSMS and the EAP and EEP);
- j. identifying and managing dam safety issues;
- k. information management, including the reporting to the Manager, RMA Monitoring and Compliance, Canterbury Regional Council, the results of any safety reviews; and
- l. audits and reviews.

- 29 The DSMP shall incorporate a *Control System Report* that outlines how the Control System complies with the requirements of the *NZSOLD Guidelines* including any amendments and is capable of operating under emergency situations. The Control System Report shall:
- a. be prepared by the Dam Designer;
 - b. provide a detailed outline of the installation and operation of the final control systems (including those required for both water management and dam safety)
- 30 The DSMP shall address health and safety issues associated with access to the embankment crests during operation of the ponds.
- 31 The DSMP shall set out how the EAP and the EEP described in conditions 34-41 will be implemented as they relate to dam safety.
- 32 The DSMP (including the Control System Report) and EAP shall:
- a. be certified by an independent certifier as appropriate and robust and meeting the requirements of the *NZSOLD Guidelines* including any amendments or updates; and
 - b. address the ability of the dam to operate under emergency conditions; and in particular that the control systems are appropriate and robust and meet the *NZSOLD Guidelines*.
- 33 The certification at condition 32(a) shall be provided to the Manager, RMA Monitoring and Compliance Canterbury Regional Council at least three months prior to the first filling or partial filling of the storage ponds with water. A copy of the certified DSMP plans shall be kept on the site throughout the commissioning phase, and the Consent Holder shall ensure that all key personnel are made aware of the plans' contents.

Emergency Action Plan

- 34 The Consent Holder shall engage a suitably qualified and registered Chartered Professional Engineer who:
- a. has a minimum of 10 years' experience in dam design, construction and the preparation and peer review of documentation required for large dams; and
 - b. is a *Category A Recognised Engineer* for the purposes of the *NZSOLD Guidelines*;
- to prepare an Emergency Action Plan (EAP). The objectives of the EAP shall be to ensure appropriate management of the risk associated with any uncontrolled, abnormal or excessive flow releases from the dams.
- 35 The EAP shall form part of the Dam Safety Management System addressed at conditions 27-33 and conditions 54 to 56.
- 36 The EAP shall be prepared in consultation with the CLG, provided for in RC135478 and shown on **Attachment CRC120610A** which forms part of this consent; and the Civil Defence Emergency Management Group; and shall, as far as practicable, be consistent with any Civil Emergency Management Group Plan governing the Canterbury Region and the Waimakariri District, pursuant to the Civil Defence Emergency Management Act 2002.
- 37 The EAP shall include as a minimum:
- a. maps of the land area located between the Eyre and Waimakariri Rivers, including land modelled as being subject to inundation in the event of abnormal or excess flow release, including emergency dewatering;
 - b. the rate of inundation for land identified under 37(a);
 - c. contact details for:
 - i. residents and how communications will be undertaken, including contingency plans for alerting (if required) all people within the area between the Eyre River and the Waimakariri River potentially impacted by an inundation or evacuation event; and
 - ii. relevant civil defence authorities;
 - d. provision for effective consultation with all property owners including assistance with preparing individual household evacuation plans;
 - e. a description of the auto-sensory system and how it alerts the dam owner, manager and engineer in the event of a developing dam breach;
 - f. provision for retaining material supplies and equipment available at short notice as specified at 5.6 of the *Wrights Road storage Ponds – EEP (Preconstruction Issue) 9 June 2017 Issue 5*, for use in an emergency situation;
 - g. recognition of the Water Storage Commissioning Plan described in conditions 23 to 26;
 - h. recognition of the Emergency Evacuation Plan (EEP) described at condition 39;

- i. a timeline showing how the inundation area progresses with time during a dam breach; and
- j. a description as to how access to embankment crests during emergencies is to occur.

38 The EAP shall be consistent with the conditions of this consent (including the other required management plans) and the Technical Specifications as they relate to the design and operation of the Water Storage Ponds.

Emergency Evacuation Plan

- 39 The **Emergency Evacuation Plan (EEP)** shall be developed in consultation with the Civil Defence Emergency Management Group, the CLG and people who are resident in the area between the Eyre and Waimakariri Rivers as approved by the Manager Monitoring and Compliance CRC, as identified in condition 37(a). The objectives of the plan shall be to:
- a. confirm the areas identified in condition 37(a) that may be subject to inundation following a storage pond breach;
 - b. outline the roles and responsibilities of the Consent Holder and other organisations involved in evacuation, with the Consent Holder retaining primary responsibility unless directed otherwise, or replaced by a competent authority;
 - c. provide details on the evacuation procedures to be followed by residents and the information that may be required by other organisations in the preparation of their own evacuation plans.

Performance standards for the EEP

- 40 As a minimum the EEP shall include detail on:
- a. a description of the likely inundation paths (including time delays) that may occur following catastrophic dam failure;
 - b. warning and evacuation areas including a 'Self Evacuation Area', an 'Assisted-Evacuation Area' and a 'Targeted Warning Area';
 - c. the roles and responsibilities of the key organisations and agencies involved in an evacuation (see 39(b));
 - d. the evacuation process (with reference to the Emergency Action Plan), including:
 - i. detection of an event or incident that has or may develop into a dam safety emergency;
 - ii. how decisions will be made to trigger a warning and/or evacuation;
 - iii. how warnings will be provided within the predicted time frames provided by condition 40(a);
 - iv. how evacuation of affected people will occur;

- v. the provision of shelter for people evacuated; and
 - vi. the return of people to any area evacuated.
- e. the signage that will identify evacuation routes;
 - f. how non-permanent (or 'transient') people will be advised of the evacuation area and the possible need to evacuate;
 - g. the limiting factors that might arise in relation to an evacuation and how those factors can be mitigated; and
 - h. an outline of the support that will be available to provide to persons for:
 - i. the preparation and updating of Household Emergency Plans; and
 - ii. the procurement of communications devices, such as the "Scada" system, for those residents who may require them and indicate that is their preferred mode of communication of dam emergencies.

- 41 The EEP shall be certified as meeting the objectives and performance standards set out in conditions 39 and 40 by a suitably qualified and experienced person.

Testing of notification systems

- 42 At least 3 months prior to the first filling or partial filling of the dam, the Consent Holder shall undertake a test of the emergency warning systems described in EEP:
- a. the testing of the emergency warning systems shall be overseen by a suitably qualified and experienced person approved by the Manager Monitoring and Compliance, CRC;
 - b. following the completion of a successful test(s), the Consent Holder shall provide a certificate to the Manager, RMA Monitoring and Compliance Canterbury Regional Council, certifying that the warning system meets the requirements (including providing warnings within the indicated inundation timeframes and that those warnings are received within the indicated inundation timeframes) described in the EEP.
- 43 The first filling or first partial filling of the dam shall not commence until such time that the certificate required by condition 42(b) has been provided to the Manager, RMA Monitoring and Compliance Canterbury Regional Council.

Certification procurement for as-built construction

- 44 At least two months prior to the first filling or first partial filling of the storage ponds the Consent Holder shall procure certification from a suitably qualified and registered Chartered Professional Engineer:
- a. who has a minimum of 10 years' experience in dam design, construction and the preparation and peer review of documentation required for large dams; and
 - b. who is a *Category A Recognised Engineer* for the purposes of the *NZSOLD Guidelines*;

that the “as built” construction of the dam is in accordance with good engineering practice, including being consistent with:

- c. the *NZSOLD Guidelines* including any amendments or updates current at the time of certification; and
- d. the requirements of the Building Act 2004;
- e. the Construction Management Plan and the Quality Assurance and Quality Control Plan; and
- f. the documents listed at condition 2 above.

- 45 This certificate shall be provided to the Manager, RMA Monitoring and Compliance Canterbury Regional Council at least one month prior to the first filling of the storage ponds. No filling shall commence until as-built certification is completed.

Provision of documents

- 46 At least two months prior to the first filling or partial filling of the storage ponds with water the following documents shall be provided to the Manager, RMA Monitoring and Compliance, Canterbury Regional Council:
- a. certifications referred to in conditions 21, 23, 26, 32, 41 and 44;
 - b. copies of the DSMP, EAP and EEP; and
 - c. the Water Storage Commissioning Plan.

COMMISSIONING

Commencement of commissioning

- 47 The filling or partial filling shall not commence at the site until the DSMP, EAP, EEP and Water Storage Commissioning Plan have been accepted by the Manager, RMA Monitoring and Compliance, Canterbury Regional Council and the Consent Holder has received written notice of the acceptance.

Water Storage commissioning

- 48 The commissioning of the storage ponds and associated activities shall be undertaken in accordance with the certified Water Storage Commissioning Plan described at conditions 23 to 26.

Plans kept on site

- 49 Copies of the DSMP, EAP and EEP shall be kept on the site throughout the Commissioning and Post Commissioning phase, and the Consent Holder shall ensure that all key personnel are made aware of the plans' contents.

Reporting by Quality Assurance Reviewer

- 50 At 3 monthly intervals throughout commissioning of the dam the Quality Assurance Reviewer shall provide a report to the Consent Holder, the Dam Designer, the Contractor and the Manager, RMA Monitoring and Compliance Canterbury Regional Council, that summarises the results of all information received, the supervision of the Quality Assurance **on site**, the Quality Assurance and Quality Control Plan and the EAP and an opinion on compliance with the Technical Specification and the conditions of this consent.

POST COMMISSIONING

EAP and EEP review

- 51 The Consent Holder shall:
- a. update the contact list(s) provided in the EAP annually; and
 - b. review the full EAP and EEP in consultation with the Civil Defence and Emergency Management Group:
 - i. at least bi-annually, with the timing of any individual review being timed to coincide with any review of the Civil Emergency Management Group Plan referred to in condition 36; and
 - ii. within 3 months following an event requiring activation of the plan and/or evacuations incorporated
- 52 Each review shall be undertaken by an independent appropriately qualified and experienced person and the review shall:
- a. consider whether the EAP and EEP continue to meet the objectives and performance standards that are set out in these conditions; and
 - b. include an update of residents within the evacuation area (including a review electoral roll and rating database information and any information received from the Consent Holder in the ongoing implementation of the EAP and EEP);

and following their review, the reviewer shall certify that the EAP and EEP (including any amendments that might be recommended by the reviewer) continue to meet the conditions of this consent.

- 53 The Consent Holder shall comply at all times with the EAP and EEP and any amendments.

Dam Safety Management Plan

- 54 The operation, maintenance and surveillance of the storage ponds and associated activities shall be undertaken in accordance with the certified DSMP (as prepared in accordance with the DSMS as required by conditions 27 to 33 and the control system as required by condition 21). The objective of the DSMP shall be to ensure the operation, maintenance and surveillance procedures for the storage ponds are consistent with the dam being managed to High PIC standards under the *NZSOLD Guidelines*. As a minimum the DSMP shall include detail on:
- a. the various components of the storage ponds (including inlet/outlet controls, emergency spillways, access and appurtenant structures and a description of their operation);
 - b. the responsibilities of the persons/entities involved in the management of the storage ponds;
 - c. the control system, including all equipment required for the management of water and for dam safety, being:

- i. the equipment and systems required for the monitoring of water levels in Ponds 1, 2 and the buffer pond, the opening and closing of gates and the operation of pump systems;
 - ii. the equipment required for assessing any leaks and embankment performance (including deformation); and
 - iii. contingency systems that ensure the continued operation of the control system (including in events of power supply or sensor failure);
- d. detail how access to the dam embankments will be maintained in the event of an emergency;
 - e. pond filling and emptying (including in the event of an emergency drawdown);
 - f. maintenance and testing for the ponds and control system equipment;
 - g. the monitoring of the liner including the testing of coupons as required by the Technical Specification; and
 - h. surveillance in accordance with Module 5 Section 4.2 of the *NZSOLD Guidelines*.

55 The DSMP shall be reviewed by the Consent Holder every twelve months, for the first two years of operation following the initial filling of the storage ponds, and thereafter every five years coinciding with Comprehensive Safety Reviews referred to at conditions 58 and 59 and also whenever a trigger event, as identified in the DSMP, occurs. The reviews shall evaluate the DSMP, the results of any inspections and any monitoring data and communications to or from the consent authorities. The review shall include reporting in accordance with Section 6.18 of the Technical Specification on results of monitoring for changes in the properties of geomembrane A2 sized coupons. The results of the review along with any required maintenance or upgrades required to comply with the Technical Specification and the *NZSOLD Guidelines* shall be recorded in writing and sent to the Manager, RMA Monitoring and Compliance, Canterbury Regional Council within one month of the review occurring.

56 The DSMP shall be re-certified by an independent certifier after any change, and at least once every five years. Such re-certifications shall be provided to the Manager, RMA Monitoring and Compliance, Canterbury Regional Council within fifteen working days of recertification.

As built plans and producer statements

57 Within 12 months of the date of construction activities ceasing, as notified under these conditions, "as built" detailed engineering plans, Producer Statements and a Completion Report shall be provided to the Manager, RMA Monitoring and Compliance, Canterbury Regional Council.

Dam safety reviews

58 In accordance with the *NZSOLD Guidelines*, a Comprehensive Dam Safety Review (CDSR) shall be undertaken every 5 years and the Review shall be provided, by the Consent Holder within 10 working days of being completed, to the Manager, RMA Monitoring and Compliance, Canterbury Regional Council.

- 59 In accordance with the *NZSOLD Guidelines*, an Intermediate Dam Safety Review (IDSR) shall be undertaken every year, and the Review shall be provided, by the Consent Holder within 10 working days of being completed, to the Manager, RMA Monitoring and Compliance, Canterbury Regional Council.
- 60 The DSMP shall be updated to address any dam safety issues identified in an IDSR or CDSR, and the updated plan provided to the Manager, RMA Monitoring and Compliance, Canterbury Regional Council within two months of receipt by the Consent Holder.

Water quality sampling

- 61 The Consent Holder shall undertake a water quality sampling and monitoring regime for the dammed water.
- 62 The water quality of the dammed water shall meet the following water quality standards:
- a. a maximum Trophic Level Index (TLI) trigger value of < 4.0(Mesotrophic); and/or
 - b. a maximum trigger level of 5 milligrams per cubic metre of Chlorophyll *a*; and
 - c. if the water stored in the ponds breaches the trigger level set out in condition 62(a) and/or (b), the Consent Holder shall commence monitoring for cyanobacteria according to the Guidelines and any updates to the Guidelines in **Attachment CRC120610B** and undertake remedial action to return the water quality to below the trigger level set out in this condition.

Water quality monitoring plan

- 63 At least 30 working days prior to the first filling or partial filling of the storage ponds the Consent Holder shall provide a Water Quality Monitoring Plan to the Manager RMA, Monitoring and Compliance, Canterbury Regional Council. The monitoring and sampling regime shall be:
- a. prepared by suitably qualified person that has been approved by The Manager Monitoring and Compliance Canterbury Regional Council;
 - b. the plan shall address:
 - i. water quality monitoring for dissolved oxygen (depth profile), temperature (depth profile); and observation of any algal or macrophyte growth and the presence of noxious or pest species of plant, algae, fish or invertebrates;
 - ii. timing of sampling;
 - iii. methods and locations of sampling in the storage ponds;
 - iv. mitigation measures to manage any adverse trends or potential exceedance of appropriate trigger levels identified in condition 62;
 - v. the frequency of reporting.
- 64 All activities in furtherance of this consent shall be undertaken in accordance with the Water Quality Monitoring Plan.

Race capacity

- 65 Prior to commissioning, the Consent Holder shall:
- a. ensure that the Waimakariri irrigation race network has sufficient capacity to accommodate a discharge of 7.3 cubic metres per second from the Waimakariri Storage Ponds to the Eyre River without overtopping the irrigation race network (including replacing the existing culverts with bridges in the race known as "MR7" on South Eyre Road and Woodstock Road, and the corner of South Eyre Road and Wolffs Road, and in the race known as "R3-4" on Wolffs Road between Harewood Road and the Eyre Siphons); and
 - b. engage a suitably qualified person to undertake an assessment (including modelling where possible) of the impact of a discharge of 7.3 cubic metres on flows in the Eyre River during high flows, taking into account reasonably predicted changes in bed level(s) overtime and the presence of structures. The results of the assessment shall be:
 - i. provided to the Consent Holder the Manager, RMA Monitoring and Compliance Canterbury Regional Council; and
 - ii. taken into account by the Consent Holder when preparing the EAP and EEP, including ensuring provision is made for alternative evacuation options should transportation infrastructure within the Eyre River flood path be at risk of being compromised by an additional discharge of 7.3 cubic metres.

Winter water levels

- 66 Between 20 April and 1 August in any year the storage of water for irrigation, domestic supply and stockwater purposes shall be limited to an operating level of 223.0 m RL in Pond 1 and 221 m RL in Pond 2 (based on the Lyttelton Vertical Datum (LVD-37) with a level of +0.0 mRL).

ADMINISTRATION

Bonding of construction, operation, maintenance, and remediation

- 67 The Consent Holder shall:
- a. construct, maintain, operate, repair, and remediate the works authorised under this consent.
 - b. At least three months prior to commencement of construction works at the site, and during the construction, operational, maintenance, and remediation phases, in relation to this consent; enter into an enforceable written agreement to provide and maintain in favour of the Canterbury Regional Council and Waimakariri District Council (the Councils), a cash bond or bank bond pursuant to sections 108(2)(b) and 108A of the Resource Management Act 1991, on terms and conditions satisfactory to the Councils in all respects.

Advisory note: if there is a cash bond it will be held by the Canterbury Regional Council. However, should conditions of the WDC land use consent RC135478 not be complied with and the non-compliance not be rectified by the consent holder in accordance with the terms of the bond, the WDC will be entitled to access the bond in order to carry out any necessary works.

- 68 The bond quantum shall be sufficient to secure compliance with the conditions of this consent in the event of any default by the Consent Holder.
- 69 Any ban bond shall be in a form used by a bank registered to conduct business in New Zealand and approved by the Councils.
- 70 The agreement shall include that the Consent Holder shall be and remain liable for meeting:
- a. If construction commences, but is not completed, the cost of:
 - i. making safe and mitigating any adverse effects arising from the work undertaken during construction; and
 - ii. reinstating land affected by the construction to a state where:
 - a. all slopes are stable and safe;
 - b. all surfaces are covered in top soil and planted in suitable pasture species; and
 - c. remedying or mitigating any breach of conditions of the consents (in so far as such a breach relates to work undertaken at the time construction ceases).
 - b. If construction is completed the cost of:
 - i. remedying or mitigating any breach of conditions of the consents; and
 - ii. avoiding, remedying or mitigating and/or monitoring any significant adverse effect on the environment, and caused by the storage ponds, which becomes apparent during or after the expiry of this consent.
- 71 The amount of the bond may vary from time to time but at any given time shall be sufficient to cover the estimated costs at that time (including any contingency) of compliance with all conditions including the:
- a. stabilisation of any dam or other structures;
 - b. the completion of planting as contemplated by condition 70(a)(ii)(B); and
 - c. maintenance and repair of the dam structures for the purposes of achieving conditions 67, 68 and 70.
- 72 The bond agreement shall also include the terms and conditions on which the bond shall be established maintained, changed, transferred or surrendered. In the event of the Councils not agreeing with the Consent Holder on the terms of the agreement, then the dispute shall be resolved through an agreed disputes resolution process or referred to arbitration.
- 73 The initial bond quantum shall be determined as follows:
- a. the Consent Holder shall provide to the Councils a report prepared by a suitably qualified and experienced person (an expert report) which: addresses all matters covered by conditions 67 and 68; has estimates of costs; and recommends the initial bond quantum. The Councils shall engage a suitably qualified and experienced person to peer review the bond quantum proposed by the Consent Holder; and

- b. in the event of the Consent Holder and the Councils not reaching agreement on the initial bond quantum, it shall be assessed by an independent bond assessor appointed by the Councils jointly, and the decision of that person shall be final and binding.

- 74 The bond quantum may be reviewed and reassessed every two years from the date the initial bond quantum is lodged until a date two years after the date on which this consent has been given effect to. The purpose of the adjustment is to reflect changes in the risk profile of the project and/or the Producer Price Index. After that, the bond quantum shall be reviewed and reassessed by the Consent Holder and the Councils at five yearly intervals for the duration of this consent. The method of the review shall follow the same procedure set out in condition 73.
- 75 The bond terms and quantum may also be varied or cancelled or renewed at any other time by agreement between the Consent Holder and the Councils, using the methodology described at condition 73.
- 76 If any time the amount of the bond is varied under conditions 74 or 75 then the Consent Holder, shall within five (5) working days of the replacement bond agreement being executed put in place a new bond for the varied amount or the additional amount required in excess of the existing bond.
- 77 If the consent is transferred to another party or person, the bond lodged by the transferor shall be retained by the Councils until a replacement bond is entered into by the transferee to ensure compliance with conditions of the consent unless conditions 70 and 71 are already complied with.
- 78 During the construction, operation, maintenance, and reinstatement phase of the Scheme, a scope of works planned for each phase will be prepared and provided by the Consent Holder to the Councils, both prior to setting the initial bond quantum, and again at each annual reassessment and six months prior to any change in phase, to assist in setting the bond quantum.
- 79 At all times the Consent Holder shall comply with the terms of bond(s) or varied bond(s)
- 80 The Consent Holder shall reimburse the Councils for all reasonable costs incurred in developing the bond agreement and any subsequent reviews or reassessments, that shall set out the terms and conditions on which the bonds shall be established, quantified, maintained, changed, transferred or surrendered.
- 81 For the avoidance of doubt, the enforceable written agreement may provide for the bond to be held after the expiry of this consent if condition 70 is not complied with.

Public/General Liability insurance

- 82 The Consent Holder shall ensure that, at least three months prior to the construction of the ponds it has in place and taking effect from when construction commences and on an ongoing basis, general/public liability insurance that provides a sufficient sum insured (as determined through conditions 83 to 89 below), to indemnify the Consent Holder in respect of all sums which the Consent Holder becomes legally liable to pay by way of compensation to third parties consequent upon:
- a. Loss of or destruction or physical damage to any tangible property including resulting loss of use; and
 - b. Loss of use of any tangible property not otherwise physically lost or damaged or destroyed.

- 83 To assist determining the form and extent of required public/general liability insurance cover, the Consent Holder shall engage a suitably qualified and experienced insurance expert with at least 10 years' experience in determining insurance cover, including the provision of public/general liability insurance policies, approved by the Manager Monitoring and Compliance CRC (*Insurance Expert*).
- 84 The Insurance Expert shall determine the appropriate sum insured for the purposes of meeting potential legal liability to third parties as required by condition 82, using recognised and standard insurance assessment methodologies. In determining that sum, the Insurance Person shall assess and advise on:
- a. The maximum potential sum which the Consent Holder may become legally liable to pay by way of compensation to third parties, including that relating to:
 - i. Infrastructure, including but not limited to houses, buildings, tracks/access routes and fences;
 - ii. Possessions that may be damaged, including but not limited to chattels and motor vehicles;
 - iii. The repair and/or replacement of household, farm, and business contents, supplies and stock (including animals);
 - iv. The repair and/or replacement of landscaping, including and allowing for costs of cleanup, restoration of land, structures and natural environment;
 - v. Provision for the payment of any costs incurred by third parties associated with the event or evacuation and recovery, including but not limited to temporary accommodation;
 - vi. Any damage to, and repair of, the assets and infrastructure of the Waimakariri District Council;
 - vii. Loss of use (including business interruption); and
 - viii. Personal injury.
 - b. The timeframes within which a review of the limits of indemnity and coverage (and terms of the policy) should occur, with at a minimum reviews taking place:
 - i. at the end of the construction period; and
 - ii. at three yearly intervals thereafter.
- 85 Following the completion of the assessment required by condition 84(a) and any review as undertaken in accordance with condition 84(b), the Consent Holder shall provide a certificate to the Manager RMA, Monitoring and Compliance, Canterbury Regional Council (as well as the WDC Planning Manager) from the Insurance Expert certifying that the recommended sum insured has been determined in accordance with condition 84. The Insurance Expert shall include an overview of how the extent of required cover has been determined.

- 86 Without limiting condition 85, the Consent Holder shall further ensure that:
- a. the Councils have, at all times after construction commences, written confirmation that the insurance required by these conditions is in place and covers all matters set out within condition 84 in the form of an insurer's annual certificate of currency;
 - b. that a copy of the certificate and an overview of the extent of cover and how it has been derived is publicly available on a website maintained by the Consent Holder;
 - c. it provides all relevant information regarding the insurance to the Councils. This obligation includes an express term that the Consent Holder immediately notify the Councils of any non-performance of the terms of insurance; and
 - d. in the event of non-performance of any term of the insurance:
 - i. it immediately notifies the Councils of the non-performance and the steps taken and to be taken to rectify the non-performance; and
 - ii. in the case of any non-performance that may adversely impact on the extent of cover in relation to dam breach or dam safety, it immediately dewater the dam.
- 87 The insurance provided under these conditions must:
- a. be on the basis that that the storage ponds are a 'non-natural' use of land; and
 - b. be sufficient to cover all sums which the Consent Holder may become legally liable to pay by way of compensation to third parties as required by condition 82 and shall not be confined to any particular geographic area, , including offsite impacts to third party property and persons as described in condition 84 including but not limited to any assets and infrastructure of the WDC, associated with any failure of any part of the proposed ponds, together with reasonable provision for reconstruction and reinstatement of the WDC assets and infrastructure.
- 88 The Consent Holder shall ensure that the sum insured and the timeframes for its review are no less than that recommended in the assessment undertaken in accordance with condition 84. A copy of the assessment undertaken will be provided to the WDC District Plan Manager for review and comment prior to obtaining the insurance cover.
- 89 The limits of indemnity and coverage and terms of the policy are to be reviewed by the Consent Holder, as a minimum, at the intervals recommended by the Insurance Expert in accordance with the process contemplated by condition 84.

Review

- 90 The Canterbury Regional Council may, once per year, on any of the last five working days of May or November, serve notice of its intention to review the conditions of this consent for the purposes of dealing 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.

Administrative charges

- 91 The Canterbury Regional Council may, once per year, on any of the last five working days of May or November, serve notice of its intention to review the conditions of this consent for the purposes of dealing 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.

Other charges or costs

- 92 The Consent Holder shall pay all costs relating to certification or engagement of others to undertake any actions or services required in terms of these conditions.

Lapse Date

- 93 The lapsing date for the purposes of s 125 shall be five years from the commencement of this consent.

Issued at Christchurch on 12 October 2020

Canterbury Regional Council

RC135478 Conditions (18 – 21) - Community Liaison Group (CLG)

Community Liaison Group (CLG)

- 18 The Consent Holder shall, within one month of its contractor being formally instructed to commence works advertise a public meeting for the purpose of facilitating the establishment of a CLG in order to consult with representatives of the community. As a minimum, the Consent Holder shall invite the following interested parties to be represented in the CLG:
- (a) Te Ngai o Tuahuriri Runanga or a nominated representative;
 - (b) ECESS (and/or representatives who reside between the Eyre River and Waimakariri River and who may be impacted by a breach of the Waimakariri Storage Ponds);
 - (c) Canterbury Regional Council and WDC;
 - (d) Landowners within 1 km of the Waimakariri Irrigation Storage Ponds.
- 19 The CLG shall be conducted in a manner of good faith and have the following objectives:
- (a) Facilitating information flow between the Consent Holder and the community regarding the implementation and environmental effects of the activities authorised by these consents (including new information, results of monitoring, and studies relevant to such effects);
 - (b) Identify any issues of concern that arise during the construction period of the Waimakariri Irrigation Storage Ponds, and on an ongoing basis.
 - (c) Identify or discussing appropriate measures to address issues raised;
 - (d) Making recommendations for the Consent Holder (and its contractors) to consider in relation to any issues identified in terms of (b) above;
 - (e) Providing the residents within the identified inundation area with annual advisories regarding the presence of the Waimakariri Irrigation storage ponds, the existence of the CLG and the availability of assistance for preparing and updating Household Emergency Plans (as part of the Emergency Evacuation Plan, including updates to account for transient or temporary residents at any property.
- 20 The Consent Holder shall assist the CLG to fulfil its objectives by, amongst other things:
- (a) Arranging an appropriate venue in the area for the meetings of the CLG and meeting any other reasonable costs of the meetings;
 - (b) Appointing a community liaison officer with authority to represent it on the CLG and ensuring the community liaison officer attends all of the formal meetings of the CLG;



- (c) Ensuring that a representative of the company responsible for the construction of the Waimakariri Irrigation Storage Ponds under contract with the Consent Holder attends all meetings;
- (d) Providing information to the CLG about progress in relation to the Waimakariri Irrigation Storage Ponds, including the environmental effects of the Waimakariri Irrigation Storage Ponds and compliance with consent conditions and development and review of any and all management plans including the Emergency Action Plan(EAP) and EEP.
- (e) Being prepared to discuss the environmental effects of the Waimakariri Irrigation Storage Ponds, any concerns in relation to human health and safety, and any complaints from the local community, including provision of further information and identification of appropriate measures to address issue raised;

21 The Consent Holder shall use its best endeavours to ensure meetings of the CLG are held as follows (unless otherwise agreed by the CLG):

- (a) The first meeting shall be held at least two months prior to the commencement of construction of the Waimakariri Irrigation Storage Ponds;
- (b) Subsequently, at least once every three calendar months during the construction period;
- (c) One meeting within six calendar months following completion of commissioning; and
- (d) Thereafter on a continuing basis, annually, or on notice if any dam safety issue arises or is raised by any party on the CLG.

Advisory

It is anticipated that the CLG will appoint a chair from amongst its members, and will develop and agree on it Terms of Reference at its first meeting.

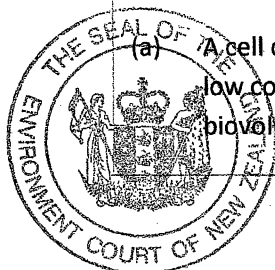


Decision Chart 1: Alert-level framework for planktonic cyanobacteria

Alert level	Actions
Surveillance (green mode) <i>Situation 1:</i> The cell concentration of total cyanobacteria does not exceed 500 cells/mL^a <i>Situation 2:</i> The biovolume equivalent for the combined total of all cyanobacteria does not exceed 0.5 mm³/L.	(See section 2.4 for the recommended framework for roles and responsibilities relating to actions, and the text box at the beginning of Section 3 for advice on interpreting the guidance in this table.) Undertake weekly or fortnightly visual inspection^b and sampling of water bodies where cyanobacteria are known to proliferate between spring and autumn.
Alert (amber mode) <i>Situation 1:</i> Biovolume equivalent of 0.5 to < 1.8 mm³/L of potentially toxic cyanobacteria (see Tables 1 and 2); or <i>Situation 2</i> ^c 0.5 to <10mm³/L total biovolume of all cyanobacterial material.	- Increase sampling frequency to at least weekly. ^d - Notify the public health unit. - Multiple sites should be inspected and sampled.
Action (red mode) <i>Situation 1:</i> ≥ 12 µg/L total microcystins; or biovolume equivalent of ≥ 1.8 mm³/L of potentially toxic cyanobacteria (see Tables 1 and 2); or <i>Situation 2</i> ^c ≥ 10 mm³/L total biovolume of all cyanobacterial material; or <i>Situation 3</i>^e: cyanobacterial scums consistently present.	- Continue monitoring as for alert (amber mode). ^d - If potentially toxic taxa are present (see Table 1), then consider testing samples for cyanotoxins. ^f - Notify the public of a potential risk to health.

Footnotes to Alert Level and Action above

(a) A cell count threshold is included at this level because many samples may contain very low concentrations of cyanobacteria and it is not necessary to convert these to a biovolume estimate.



- (b) In high concentrations planktonic cyanobacteria are often visible as buoyant green globules, which can accumulate along shorelines, forming thick scums (see Appendix 3). In these instances, visual inspections of water bodies can provide some distribution data. However, not all species form visible blooms or scums; for example, dense concentrations of *Cylindrospermopsis raciborskii* and *Aphanizomenon issatschenkoi* are not visible to the naked eye (see Appendix 3).
- (c) This applies where high cell densities or scums of 'non-toxigenic' cyanobacteria taxa are present (i.e., where the cyanobacterial population has been tested and shown not to contain known toxins).
- (d) Bloom characteristics are known to change rapidly in some water bodies, hence the recommended weekly sampling regime. However, there may be circumstances (e.g., if good historical data/knowledge is available) when bloom conditions are sufficiently predictable that longer interval sampling is satisfactory.
- (e) This refers to the situation where scums occur at the recreation site for more than several days in a row.
- (f) Cyanotoxin testing is useful to: provide further confidence on potential health risks when a health alert is being considered; enable the use of the action level 10 mm³/L biovolume threshold (i.e., show that no toxins are present; and show that residual cyanotoxins are not present when a bloom subsides).

Source of Alert-level framework for planktonic cyanobacteria: Ministry for the Environment and Ministry of Health. 2009. *New Zealand Guidelines for Cyanobacteria in Recreational Fresh Waters – Interim Guidelines*. Prepared for the Ministry for the Environment and the Ministry of Health by SA Wood, DP Hamilton, WJ Paul, KA Safi and WM Williamson. Wellington: Ministry for the Environment.





Exercising of Resource Consent CRC120610

It is important that you notify Environment Canterbury when you first start using your consent.

GRANTED TO:	Waimakariri Irrigation Limited
A WATER PERMIT (S14):	To dam up to 8.2 million cubic metres of water.
LOCATION:	Wrights Road, OXFORD

Even if the consent is replacing a previous consent for the same activity, you need to complete and return this page.

A consent can only be made active after the activity has commenced and all pre-requisite conditions have been fulfilled e.g. installation of water meter and/or fish screen. If you require further advice, please contact our Customer Services section on 0800 324 636 or by email at ecinfo@ecan.govt.nz.

Providing this information will:

- Validate your consent through to its expiry date
- Minimise compliance monitoring charges
- Help provide an accurate picture of the state of the environment.

If consent CRC120610 is not used before 28 August 2025 this consent will lapse and no longer be valid.

Declaration:

I have started using this resource consent.

Action taken (e.g. pasture irrigated, discharge from septic tank/boiler/spray booth etc):

Date I started using this resource consent (Note: this date cannot be in the future): _____

Signed: _____ **Date:** _____

Full name of person signing (please print): _____

Please return to:

**Business Support
Environment Canterbury
PO Box 345
Christchurch 8140**

Fax: (03) 365 3194
Email: ecinfo@ecan.govt.nz

File: CO6C/33499
Customer No: EC111432