

Groundwater and Lowland Drainage

19. The consent holder shall avoid, remedy or mitigate adverse effects on groundwater, gravel pit operations and lowland drainage which occur as a result of the exercise of this consent.
20. Prior to the commencement of any activities authorised by these consents (including the finalisation of the Groundwater and Drainage Plan listed in condition 10), the consent holder shall appoint a Groundwater Technical Review Panel (GTRP).
21. The GTRP shall comprise of five to seven people. The panel members shall be selected so that collectively they provide expertise in the following areas:
 - (a) The operation of the Central Plains Water Enhancement Scheme
 - (b) Lowland drainage network operations in Canterbury
 - (c) Hydrogeology
 - (d) Land drainage
 - (e) Groundwater quality monitoring
 - (f) Surface water monitoring
22. The GTRP shall comprise at a minimum the following:
 - (a) A technical representative appointed by Central Plains Water Enhancement Scheme management,
 - (b) A technical representative of potential effects on gravel pit operations in the Miners Road area.
 - (c) A technical representative of drainage schemes management from the lower plains,
 - (d) An engineer with expertise and experience in both large scale and localised solutions to land drainage needs,
 - (e) An engineer or scientist with expertise and experience in Canterbury groundwater systems
 - (f) A technical representative from the Canterbury Regional Council
23. The role of the GTRP shall be to:
 - (a) To review the Groundwater and Drainage Plan described in condition 25, and recommend its adoption with amendments as it considers appropriate;
 - (b) To receive and review reports on the environmental monitoring and mitigation undertaken by the consent holder and any other relevant monitoring results and reports prepared by the Canterbury Regional Council or other bodies;
 - (c) To review reports submitted by the consent holder and complaints referred to it in accordance with condition 28, and within two months of the receipt of these reports, convey recommendations to the consent holder regarding the validity of the interpretation of monitoring data and implementation of mitigation measures undertaken by the consent holder;

- (d) To determine the likely cause of reported problems with drainage or groundwater including using information gathered in accordance with condition 26, propose mitigation or remedial measures and determine the extent to which the consent holder must implement them, or contribute to the cost of implementing them, given the consent holder's degree of contribution to the problem identified in accordance with condition 28(f). Where effects cannot be addressed by mitigation or remedial measures they shall be addressed by way of financial compensation;
- (e) To advise the Canterbury Regional Council if there are grounds to review conditions of consent in the event that an adverse effect arises which is not mitigated or remedied by the consent holder to the extent recommended by the GTRP;
- (f) To address other matters that may arise from the exercise of consent CRC061973.

24. The GTRP shall

- (a) Meet no less frequently than once a year
- (b) Be funded by the consent holder.
- (c) Operate on a majority basis.
- (d) Report no less frequently than once a year on its conclusions and recommendations including any complaints referred to it to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Officer and the consent holder.

25. Groundwater and Drainage Plan

- (a) Prior to the first exercise of this consent, the consent holder shall develop a Groundwater and Drainage Plan outlining the measures that will be undertaken to monitor and mitigate potential adverse effects that may arise in regard to the following issues:
 - (i) Loss of Waimakariri River seepage on the Christchurch-West Melton and Kaiapoi aquifer systems;
 - (ii) Increase in the concentrations of nitrate-nitrogen or other contaminants in the groundwater both beneath and downstream from the Scheme area; and
 - (iii) Raised groundwater levels both beneath and downstream from the Scheme area, including any effects on gravel pit operations.
- (b) The key objectives of the Groundwater and Drainage Plan shall be to outline the groundwater monitoring and reporting programme and to describe how the consent holder will avoid, remedy or mitigate adverse effects on groundwater and lowland drainage which occur as a result of the exercise of this consent.
- (c) The Groundwater and Drainage Plan shall include:
 - (i) The location of all farms using water from the Central Plains Water Enhancement Scheme and the associated land use.
 - (ii) The location of all surface water quality monitoring sites.

- A. There shall be at least two monitoring sites in each of the following eight lowland streams that flow into Lake Ellesmere/Te Waihora: the Halswell River, LII River, Selwyn River, Irwell River, Boggy Creek, Hanmer Road Drain, Doyleston Drain, and Harts Creek. The monitoring sites on lowland stream shall include one site near the spring-fed source in the upper catchment and one site upstream of the discharge point to Lake Ellesmere/Te Waihora.

Note that the lower stream sites are those currently monitored on a monthly basis by ECan.

- B. There shall be at least four monitoring sites in Lake Ellesmere/Te Waihora.
- C. The consent holder may use data collected by the Canterbury Regional Council or any other body in lieu of establishing new monitoring sites. In the event that other authorities reduce their monitoring of Lake Ellesmere/Te Waihora or lowland streams, the consent holder shall ensure that the sixteen lowland stream monitoring sites and the four Lake Ellesmere/Te Waihora monitoring sites are maintained.

- (iii) The location, depth and screened interval of specific monitoring bores for assessing effects of the scheme activities on groundwater: specifically groundwater levels, groundwater quality, surface water flow and surface water quality.

- A. There shall be at least twenty monitoring bore clusters within the scheme area. At least ten clusters shall be located at the down-gradient boundaries of ten different farms that are irrigated by the scheme. At least ten other clusters shall be located at the down-gradient boundaries of farms that are not irrigated by the scheme. The farms selected shall represent a variety of farm types.
- B. Individual monitoring bores within each cluster shall have a screen no longer than 3 metres.
- C. Each monitoring bore cluster shall include a sufficient number of individual bores to cover the fluctuations of the water table at that site, ensuring that the water table will be intercepted by at least one bore screen at all times.
- D. The diameters of individual bores shall be sufficient to allow the bores to be purged and sampled according to the sampling procedure specified in condition 25(i)(iii).
- E. If one of the scheme farms associated with a monitoring cluster no longer irrigates using water from the scheme, a new cluster shall be established immediately down-gradient of another scheme farm. Similarly, if one of the non-scheme farms associated with a monitoring cluster joins the scheme, a new cluster shall be established immediately down-gradient of another non-scheme farm.
- F. At least one groundwater level monitoring bore shall be located in the area of the Miners Road gravel extraction pits.

- G. A monitoring bore shall be replaced by a deeper monitoring bore if a monitoring bore is dry for more than six months.
 - (iv) A description of the mitigation measures that may be implemented to address all the potential adverse effects related to groundwater level, groundwater quality and surface water flow and quality issues;
 - (v) A description of the specific triggers that will initiate the implementation of the mitigation measures in response to the monitoring outcomes for any effects that may arise related to groundwater levels, groundwater quality, surface water flows and surface water quality;
 - (vi) The strategy for monitoring and reporting on the effectiveness of the mitigation measures to the Canterbury Regional Council, the GTRP and the affected land owners.
- (d) Surface water quality monitoring
- (i) Using the existing recent surface water quality data and data collected from the surface water monitoring prior to commencement of irrigation activity, the consent holder shall identify specific baseline nutrient and other contaminant concentration levels in the lowland streams, and annual average mass load of nutrients (Nitrate-N) from streams to Lake Ellesmere.
 - (ii) Trigger levels shall be identified as a percentage increase or an absolute concentration increase in nutrient j(Nitrate-N) concentration from the agreed mean baseline level at individual sites, and as a percentage increase or absolute increase from the annual average annual mass load to Lake Ellesmere calculated from the standard monitoring sites and previously determined as the baseline.
 - (iii) Specific trigger levels identified in the Groundwater and Drainage Plan shall be submitted to the GTRP for their review and agreement.
 - (iv) Final agreed trigger levels shall be submitted to the Canterbury Regional Council, Attention: RMA compliance and Enforcement Manager.
 - (v) The Canterbury Regional Council may serve notice on the consent holder of its intention to review the conditions of this consent to deal with any exceedence of any surface water quality trigger level specified in the Groundwater and Drainage Plan, which is due to the exercise of this consent.
- (e) Groundwater level monitoring
- (i) Groundwater levels in the monitoring bores identified in the Groundwater and Drainage Plan shall be measured at least once per month or any subsequent frequency agreed upon by the GTRP.
 - (ii) Groundwater level measurements shall commence at least one year prior to the use of water under resource consent CRC061973.
 - (iii) The frequency of the water level measurements may only be reviewed by the GTRP two years after the commencement of the use of water under resource consent CRC061973.

- (f) No later than six months prior to the use of water under resource consent CRC061973, the consent holder shall undertake a baseline survey of the lowland drainage systems of the Central Plains taking into consideration historical data, and submit a report to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager. The report shall build on existing data, and include:
- (i) An inventory of drains and streams, their location, size and capacity,
 - (ii) An inventory of sewerage systems (reticulated and individual septic tanks),
 - (iii) The conditions of these facilities, their capacities, maintenance activities, dates of installation, histories of water-level related issues,
 - (iv) Records of stream and drain flows and groundwater levels,
 - (v) Existing management and administration arrangements for the drainage schemes,
 - (vi) Current costs of maintenance and operation of the drainage schemes.
- (g) Using the existing groundwater level data and data collected from the groundwater level monitoring, the consent holder shall identify specific groundwater levels that shall trigger a response from the consent holder to avoid, mitigate or remedy any adverse effects related to increased groundwater levels, as a result of exercising this consent, including increased groundwater levels or increased duration of high groundwater levels.
- (i) Specific trigger levels shall be submitted to the GTRP for their review and agreement.
 - (ii) Final agreed trigger levels shall be submitted to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager.
- (h) In the event that the trigger levels specified in accordance with condition (25)(g)(ii) are reached, the consent holder shall undertake measures to avoid, mitigate or remedy any adverse effects related to groundwater levels that may arise as a result of exercising this consent. Mitigation measures may include but not be limited to;
- (i) additional monitoring
 - (ii) restricting the use of water for irrigation;
 - (iii) the widening and/or deepening of drains to increase their capacity;
 - (iv) the installation of more drains;
 - (v) providing pumped drainage for affected properties or facilities;
 - (vi) upgrading sewerage reticulation systems to reduce groundwater infiltration into pipes;
 - (vii) more frequent maintenance of existing drains, including cleaning
 - (viii) financial compensation in lieu of remedial works.

- (i) Groundwater quality monitoring
 - (i) For two years prior to, and ten years after the use of water under CRC061973 commences, groundwater quality samples shall be taken from the bores identified in the Groundwater and Drainage Plan in March, June, September and December each year.
 - (ii) Ten years after the use of water under CRC061973 commences, the frequency of groundwater quality sampling shall reduce to twice per year, where each sample shall be taken during August-September and April-May each year.
 - (iii) Water quality sampling shall be undertaken in accordance with the latest version of the Canterbury Regional Council guidelines for the collection of groundwater quality samples.
 - (iv) As a minimum, the water quality analyses shall include *E.coli*, pH, electric conductivity, alkalinity, chloride, ammonia-N, nitrate-nitrogen, total-N dissolved reactive phosphorus and sulphate.
 - (v) If any bore within the area shown on the attached Plan CRC061973 exceeds a nitrate-nitrogen concentration of 11.3 grams per cubic metre and the bore supplies domestic water to a dwelling that has infants under the age of six months at the time of the exceedance, then the consent holder shall supply an alternative drinking water supply to those dwellings until it can be demonstrated that the concentration of nitrate-nitrogen in the subject bore is below 11.3 grams per cubic metre, unless it can be demonstrated that the concentration of nitrate-nitrogen in the subject bore exceeded 11.3 grams per cubic metre on at least one occasion prior to the use of water by the consent holder or unless it is concluded in accordance with condition 28(f) that the use of water by the consent holder was not the likely cause of the exceedance.
 - (j) The consent holder shall submit the Groundwater and Drainage Plan to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Officer prior to the use of water by the Scheme for irrigation. Written confirmation that the Groundwater and Drainage Plan complies with the requirements of this condition must be obtained from the Canterbury Regional Council prior to using water for irrigation. Confirmation shall not be unreasonably delayed or withheld.
26. The consent holder shall prepare a report describing the results of the environmental monitoring outlined in the Groundwater and Drainage Plan, for the period from 1 July to the following 30 June each year. The consent holder shall submit the report to the GTRP by the following 1 September. The groundwater report shall include all the monitoring data and an interpretation of background conditions and impacts arising from the consent activities. The consent holder shall also submit the report to the Canterbury Regional Council, Attention: Compliance and Enforcement Manager, by 1 September each year.
27. Prior to 1 October each year, the GTRP shall review the report described in condition (11) and make recommendations to the consent holder regarding the validity of the interpretation of monitoring data and the implementation of mitigation measures undertaken by the consent holder. Within 20 working days of any meeting of the GTRP, the consent holder shall provide the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Officer, a copy of the recommendations made by the GTRP.
28. Response to Groundwater Complaints

When the consent holder is notified by a “complainant” of an adverse environmental effect, then:

- (a) Within 10 working days of receipt of the complainant, the consent holder (or a suitably qualified nominee) shall commence an investigation of the complaint,.
- (b) Within five working days of completion of its investigation, the consent holder shall notify the complainant of
 - (i) The outcome of the investigation, including a description of the assessment process that the consent holder has undertaken regarding the issue raised by the complainant and options to mitigate or remedy the effects;
 - (ii) Descriptions of mitigation options, including details of timing and cost sharing;
 - (iii) The complainant’s right to refer the complaint to the GTRP, and the contact details of the GTRP.
- (c) The consent holder may offer to mitigate or remedy the situation immediately subject to the complainant agreeing to reimburse the consent holder for the relevant portion of the cost of any such remedy as in condition (b)(ii). Such reimbursement will not extend to the consent holder’s cost in assessing the complaint or any costs of reviews of the complaint by the GTRP.
- (d) The consent holder may, instead of undertaking any remedial work or completing the assessment process, with the agreement of the complainant choose to negotiate with the complainant to undertake or pay the cost of those remedial works directly to the complainant, or agree to provide financial compensation to the complainant for losses, or otherwise reach agreement with the complainant in respect of any damage.
- (e) Any agreement for the consent holder to pay costs directly to the landowner shall include a written undertaking from the property owner, that on the sale of the property, the property owner will advise the purchaser that the holder of this consent is no longer liable for any effects associated with the use of water that may occur on that property. [as suggested by Ecan]
- (f) For the purpose of this condition, mitigation or remedy shall include works to an extent that alleviates the significance of the adverse effects of the exercise of this consent.
- (g) The consent holder shall notify the Canterbury Regional Council, Attention: Compliance and Enforcement Manager of any complaints made, any recommendation made by the GTRP, whether or not the consent holder and the complainant are satisfied with the recommendation, and any actions undertaken to remedy the situation.

Deleted: Any agreement for the consent holder to pay costs directly to the landowner shall be registered on the title of the subject property/ies.