

Before the Hearing Panel appointed by Canterbury Regional Council

IN THE MATTER OF The Resource
Management Act 1991
AND

IN THE MATTER OF Application CRC190445
by Christchurch City
Council for a discharge
permit to discharge
stormwater into land and
to water and a coastal
permit to discharge
stormwater to coastal
water from the reticulated
stormwater network.

Section 42A Officer's Report

Date of Hearing: Commencing 5 November 2018

Report of Nick Reuther

- I. My name is Nick Reuther and I have been employed by the Canterbury Regional Council (CRC) as a Consent Planner and now Senior Consent Planner since October 2017. I hold a Master of Applied Science in Environmental Management degree from Lincoln University, and a 'Diplom' in Energy and Resource Management from Nürtingen-Geislingen University in Germany¹. I have experience in processing of, as well as preparing applications for, stormwater and other discharge permits, land use consents for activities within and outside the beds of rivers and water permits for groundwater take and uses.
- II. As discussed below, an application from Christchurch City Council (CCC) was originally received in June 2015 but this application has since been relodged with some amendments. The processing of the original resource consent application CRC160056 and preparation of this Section 42A report was started by Ms Adele Dawson, who is currently employed at Incite as a Senior Resource Management Consultant and was employed by CRC as a Consents Planner and Senior Consents Planner between January 2012 and August 2017. Ms Dawson processed the initial application up until the time it was amended to application CRC190445.
- III. This report is prepared under the provisions of Section 42A of the Resource Management Act 1991 (RMA). This section allows a Council officer to provide a report to the decision-maker on a resource consent application made to the Council and allows the decision-maker to consider the report at the hearing. Section 41(4) of the RMA allows the decision-maker to request and receive from any person who makes a report under Section 42A *"any information or advice that is relevant and reasonably necessary to determine the application"*.

¹ The German 'Diplom' is equivalent to a Master's degree in NZ.

- IV. This report will provide the Hearing Panel with information and advice related to:
- a. The background to the application;
 - b. Details of the notification of the application and submissions received;
 - c. An outline of the relevant legal and planning provisions;
 - d. An audit of the assessment of environmental effects provided;
 - e. Details of Council policy relevant to the applications;
 - f. Recommendations in relation to the matters specified in Part 2 of the RMA; and
 - g. Recommendations on the decision to be made by the decision-maker including comments on whether the application can be granted or should be declined; if the application is to be granted what measures are required to avoid, remedy or mitigate any adverse effects; what monitoring could be undertaken and the duration of the consent.
- V. This report also draws on technical reports provided by a number of experts being staff employed by CRC and external consultants. Each expert has prepared a report under the provision of Section 42A of the RMA, supporting the key conclusions that are referenced in this report. The experts and their reports are:
- a. Mr Rowan Freeman, CRC Principal Science Advisor, Environmental Science and Hazards: Appendix 1;
 - b. Mr Zeb Etheridge, CRC Senior Scientist, Groundwater Science: Appendix 2;
 - c. Mr Michael Law, Senior Water Resources Engineer (Beca): Appendix 3;
 - d. Ms Jolene Irvine, CRC Engineering Planning Advisor and Mr Matthew Surman, CRC Asset Management Engineer: Appendix 4;
 - e. Ms Michele Stevenson – Senior Scientist, Surface Water Science (Freshwater): Appendix 5; and
 - f. Dr Lesley Bolton-Ritchie – Senior Scientist, Surface Water Science (Coastal): Appendix 6.
- VI. Any further changes to the proposal and mitigation may affect the conclusions of these reports. This report will highlight gaps in the information supporting the application and will make recommendations as to how these gaps may be addressed by the Applicant. Where feasible, I will comment on the implications of any changes made during the course of the hearing. Where this is not feasible a separate addendum report may be required.
- VII. It should be emphasised that any conclusions reached, or recommendations made in this report, are not binding for the decision maker. It is not assumed that the decision-maker will reach the same conclusion or decision having considered all the evidence to be brought before it by the Applicant and submitters.

EXECUTIVE SUMMARY

The Christchurch City Council (CCC) has applied for a 'comprehensive' resource consent from the Canterbury Regional Council (CRC) to authorise discharges of stormwater from their reticulated stormwater network, as well as other stormwater discharges from within the urban limits of Christchurch City and from settlements on Banks Peninsula. Stormwater from these areas will ultimately discharge into land, to freshwater and to the coastal environment.

The area covered by the resource consent application has been divided into seven catchments:

- i. Outer Christchurch;
- ii. Pūharakekenui/Styx River;
- iii. Ōtākaro/Avon River;
- iv. Ihutai/Avon-Heathcote Estuary and Coastal areas;
- v. Huritini/Halswell River;
- vi. Ōpāwaho/Heathcote River; and
- vii. Te Pātaka o Rākaihautū/Banks Peninsula.

CCC is seeking an overarching resource consent that sets out the framework for managing stormwater in an integrated manner across the district, which is an approach promoted by objectives and policies in the relevant regional plans, such as the Canterbury Land and Water Regional Plan (LWRP). In addition, the 'comprehensive' discharge permit, if granted, would replace a number of existing discharge permits held by CCC, provide a consistent approach for managing stormwater throughout the CCC jurisdiction and result in efficiencies around monitoring the impacts of stormwater discharges across the district.

Managing stormwater discharges on such a scale is challenging, not only due to the scale of the activity but also because information about stormwater quality, the efficacies of stormwater treatment devices and impacts on receiving environments that can be specifically attributed to stormwater runoff, can be lacking. On this basis, CCC have proposed an Adaptive Management Approach to manage stormwater within the district.

This approach is based on setting objectives and targets for water quality and water quantity through proposed resource consent conditions. Stormwater Management Plans (SMPs) will be developed for each of the seven catchments that will contain information on the types of mitigation measures proposed for each catchment, to manage stormwater and to achieve the objectives and targets set for that catchment. Although some changes are recommended, the proposed objectives and targets are considered to be generally in line with the receiving environment outcomes sought by the relevant regional plans. The SMPs will be complemented by an Environmental Monitoring Programme (EMP), which aims to collect information to determine if the objectives and targets are being met. If the targets are not being met, CCC proposes to investigate the reasons why and determine if more mitigation is required and feasible.

CCC has developed a contaminant load model (CLM) and modelling results provided indicate that the mitigation proposed will result in an overall reduction in contaminants discharged into surface water via stormwater. CCC is proposing to use these contaminant reduction targets to measure the effectiveness of stormwater management practices over the duration of the resource consent, should it be granted, and to demonstrate a commitment to continually improve stormwater quality to meet the receiving environment objectives and targets described above.

The CRC acknowledges the amount of effort and resources CCC has put into developing such a comprehensive proposal and commend CCC's intent to manage stormwater in a more integrated way and to improve the quality of discharges across the district.

Overall, it is considered that an Adaptive Management Approach, in light of the complexities surrounding stormwater management at this scale, is appropriate. However, the audit of the proposal and the supporting assessment of effects on the environment (AEE) has identified a number of areas where further clarification from CCC is required to support the proposal and to ensure that the Adaptive Management Approach is robust and will achieve desired outcomes. These key issues identified are:

- i. Management of development and 'high-risk' sites – CCC proposes to accept under the comprehensive resource consent discharges from development and 'high-risk' industrial sites after 2025. Many of these sites are currently required to obtain a separate discharge permit from the CRC due to the environmental risks associated with stormwater discharges from such sites. CCC has not provided sufficient detail in the application regarding how these sites will be managed once authorised to discharge under the comprehensive resource consent. If these sites are not managed appropriately, there is a potential for adverse environmental effects to be greater than anticipated.
- ii. Surface Water Quality – The audit of the CLM questions the validity of assumptions and data used in the model to determine the resulting contaminant load reductions. In addition, the appropriateness of using the model throughout the period of consent to demonstrate success in achieving the water quality outcomes, is questioned.
- iii. Cultural Effects – CRC acknowledges that CCC has consulted with Papatipu Rūnanga and Te Rūnanga o Ngāi Tahu, and that a letter has been provided by these parties outlining that the comprehensive resource consent application is not being opposed. However, in absence of cultural impact assessments for all catchments, comments on the appropriateness of the proposed cultural health and other Receiving Environment Objectives and Targets and acceptance to undertake the cultural health monitoring with the Applicant, CRC is unable to conclude what the effects on cultural values will be.

The technical reports supporting this Section 42A Officer's Report include more detailed discussion around each of the effects that could arise from the proposal and highlight areas where further clarification may be required from CCC. In addition, where possible, recommendations have been provided on further mitigation or

amendments to conditions to ensure that the effects of the proposal will be adequately monitored and mitigated.

In order to make a decision on this application, the Hearing Panel will need to be satisfied that the effects of the discharges will be minor or that the activity is not contrary to the objectives and policies of a relevant plan (i.e. that the proposal meets the gateway tests required under Section 104D of the Resource Management Act for non-complying activities). The Section 42A Officer's Report and supporting technical reports provide a detailed discussion of the proposal and the audit of the Applicant's AEE with regard to the potential effects from the stormwater discharges within the district. The report also provides a discussion on whether the proposal aligns with the relevant planning frameworks, and provides conclusions and recommendations relating to the decisions that need to be made.

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INTRODUCTION

Application Overview

1. Christchurch City Council ('CCC' or 'the Applicant') has applied for a discharge permit and a coastal permit to authorise the discharge of stormwater from the CCC's reticulated stormwater network, as well as discharges to waterways and land within the urban limits. The application covers all stormwater discharges from the reticulated networks within Christchurch City and the Banks Peninsula settlements that discharge to land, freshwater and the coastal environment. The area covered by this resource consent is shown in Figure 1.

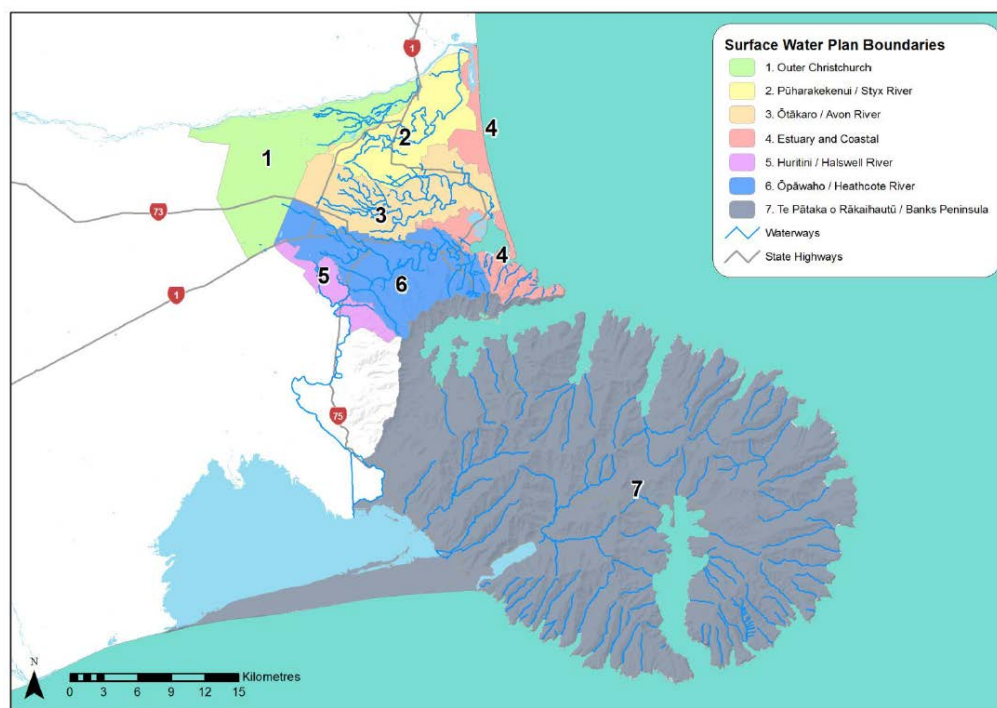


Figure 1: Catchments covered by Comprehensive Stormwater Network Discharge Consent

2. The Applicant originally lodged an application for resource consent in June 2015 (CRC160056), which was publicly notified in early 2016 at the Applicant's request. Following the receipt of submissions, further information from the applicant was requested. This information was audited and there were outstanding concerns with regard to the proposal and potential effects on the environment and inconsistency with the planning framework. As a result, the applicant requested a timeframe extension to complete work on a revised approach with an intent to develop consent conditions that would demonstrate a commitment to improving the quality of stormwater discharges. The work involved the development of a Contaminant Load Model (CLM) for the major river catchments within Christchurch City and the development of contaminant load reduction targets.
3. Further information was provided to CRC on 9 July 2018 including details of the CLM approach and revised resource consent conditions. At this time, the Applicant proposed to amend the proposal to include the authorisation of all stormwater discharges to the reticulated network from 1 January 2025 or on the expiry of individual consents held by property owners. The original resource consent application excluded 'high risk' sites.

4. Following review of this information it was determined by CRC that the amendment to include all stormwater discharges under the resource consent framework was beyond the scope of the original application. This was due to a change in the scale, intensity and character of the proposed activity as the original application excluded 'high risk' sites. The inclusion of such discharges has the potential to significantly change the nature of the stormwater discharges due to varying contaminant sources and loads. It was therefore determined that the original application with further information should be processed as a new application.
5. The new application for resource consent CRC190445 was formally received on 26 July 2018.
6. While the Applicant currently holds resource consents for some catchments within the CCC jurisdiction (further addressed in the 'Background' section below), the purpose of the Comprehensive Stormwater Network Discharge Consent (CSNDC) is to authorise all discharges from the network that have been accepted by the Applicant, as well as direct discharges to waterways and land within the urban limits. The comprehensive discharge permit, if granted, is sought to replace these existing discharge permits and to progressively take over other separately consented discharges via the network.
7. With this approach the Applicant seeks to improve consistency in stormwater management across the catchments to be consented, and to provide more certainty to the community around the management of stormwater and associated issues. One resource consent covering all stormwater discharges managed by CCC also reduces the administration and monitoring of, and reporting on, the resource consent for both the Applicant and CRC.
8. A 25-year resource consent duration is requested by the Applicant. The initial application CRC160056 requested a 35-year duration; however, as a result of the consultation carried out with Papatipu Rūnanga, the Applicant now seeks a 25-year resource consent duration.
9. The application outlines the approach to stormwater management that the CCC is seeking. To summarise, CCC proposes:
 - a. An overarching resource consent that sets out the framework for stormwater management. The resource consent conditions proposed include objectives and targets for water quality and water quantity for the different sub-catchments.
 - b. Stormwater management plans (SMPs) for the seven catchments will be produced and implemented. These plans will describe how the requirements of the resource consent conditions, including targets, will be achieved. The seven catchments are:
 - i. Outer Christchurch;
 - ii. Pūharakekenui/Styx River;
 - iii. Ōtākaro/Avon River;
 - iv. Ihutai/Estuary and Coastal;
 - v. Huritini/Halswell River;
 - vi. Ōpāwaho/Heathcote River; and
 - vii. Te Pātaka o Rākaihautū/Banks Peninsula.
 - c. The SMPs, when produced or reviewed, will be made available to the Stormwater Issues and Management (SWIM) Group. SWIM was set up

as a group of senior managers from CCC and CRC whose purpose is to resolve any major issues relating to the discharge of stormwater to water and to escalate any issues it is unable to resolve. I note that since lodgement of the application, the group has been renamed to Water Issues Management (WIM) Group, to reflect a broader three-waters approach to water management.

10. The application has been prepared by the Applicant and Golder Associates (NZ) Ltd (Golder). The application is accompanied by the following key information/documents:
 - a. Ōtākaro/Avon Stormwater Management Plan;
 - b. Ōtākaro/Avon Stormwater Management Plan: Technical Reports;
 - c. Environmental Monitoring Programme;
 - d. Huritini/Halswell River Stormwater Management Plan;
 - e. Pūharakekenui/Styx Stormwater Management Plan Part A;
 - f. Pūharakekenui/Styx Stormwater Management Plan Part B;
 - g. Ōtākaro/Avon Stormwater Management Plan Cultural Impact Assessment;
 - h. Ōtākaro/Avon Surface Water Plan;
 - i. Pūharakekenui/Styx Stormwater Management Plan Cultural Impact Assessment; and
 - j. Huritini/Halswell River Stormwater Management Plan Cultural Impact Assessment.
11. A number of other technical reports were provided with the application, which provide information regarding the Applicant's management of stormwater discharges. These are as follows:
 - a. GHD Limited – Christchurch City Council Stormwater Modelling Specification for Flood Studies. September 2012;
 - b. GHD Limited – Christchurch City Council Stormwater Modelling Consolidation Model Status Report Summary. August 2012; and
 - c. Golder Associates (NZ) Limited – Assessment of Current and Future Stormwater Contaminant Load for Christchurch: CLM Modelling Report – Best Practice Infrastructure. July 2018.
12. CRC received the following additional information in September 2018:
 - a. Contaminant Load Modelling (CLM) approach.
 - b. Letter of non-opposition from Ngā Rūnanga.
13. This information is attached as Appendices 7 and 8 of this report, respectively. Given the timing of when the additional information was received, CRC has not had the opportunity to consider this information during the drafting of this Section 42A report or any of the expert reports. On this basis, the content of the letters received will need to be addressed at the hearing

Existing Resource Consents

14. The Applicant currently holds the following catchment specific stormwater network consents:

- a. **CRC000315:** Authorises the discharge of stormwater from residential, commercial and industrial roofing and residential hardstand areas from individual properties within parts of Christchurch City. The resource consent expires in 2034.
 - b. **CRC090292:** Authorises the discharge of stormwater from roofs, hardstand areas and pervious areas from developed sites and during construction of some development sites within the Avon, Estuary, Halswell, Ōtukaikino and Styx catchments. Some high-risk sites were excluded from this resource consent. This resource consent expired in June 2016, although CCC is entitled to continue to operate under the existing consent in accordance with Section 124.² The purpose of CRC090292 was to authorise stormwater discharges for a short term to enable information to be collected to support new applications for the different catchments of the city.
 - c. **CRC120223:** Authorises the discharge of stormwater from the South West area of Christchurch onto and into land and to surface water or groundwater from roofs, roads and hardstand areas and from development areas during construction. High-risk contaminated sites or commercial/industrial sites can be excluded along with large scale construction-phase discharges. The resource consent expires in 2047.
 - d. **CRC131249:** Authorises the discharge of stormwater from the Pūharakekenui/Styx River catchment onto land or into surface water or groundwater from roofs, roads, hardstand areas and from development areas during construction. High risk contaminated sites or commercial/industrial sites can be excluded along with large scale construction phase discharges. This resource consent expires in 2048.
15. The CSNDC, if granted, will replace resource consent CRC090292, and it is understood that the Applicant will surrender resource consents CRC120223, CRC131249 and CRC000315, if this comprehensive resource consent is granted.

BACKGROUND

Overview

16. The following section provides a summary of other existing strategy and policy documents relating to management of stormwater in Christchurch City and Banks Peninsula.

Joint Christchurch City Council and Environment Canterbury Stormwater Management Protocol

17. The Joint Christchurch City Council and Environment Canterbury Stormwater Management Protocol (the 'Protocol') was developed in 2006 and revised in September 2008 and November 2010. The aim of the Protocol is to set out how CCC and CRC will work together to achieve integrated stormwater management in Christchurch.³

² Application CRC160056 is still 'in process' to protect the continuation of CRC090292 under Section 124 of the RMA.

³ CCC & ECan (2010). *A joint Christchurch City Council & Environment Canterbury Stormwater Management Protocol*. Environment Canterbury Report number: U10/12. Christchurch, New Zealand. Accessible under: <https://www.ccc.govt.nz/assets/Documents/Services/Stormwater-drainage/PlanningAndConsentsProtocolForSurfaceWaterManagement-environmentecology.pdf>

18. The principles and agreed practices of the Protocol have informed the cooperative approach that both authorities have taken to finding solutions to stormwater management in Christchurch, including the establishment of the Water Issues Management (WIM) Group and operational-level Stormwater Alliance Team (SWAT).
19. Under the Protocol, if issues arise in regard to compliance with this discharge permit (if granted), the problems are required to be resolved in accordance with the principles and agreed practices of the Protocol, which include:
 - a. The establishment of WIM, which is required to meet at least twice per year to identify, discuss and resolve stormwater issues of strategic importance;
 - b. Catchment management plans and their resource consents are intended to set out requirements for new stormwater infrastructure and to retrofit existing stormwater infrastructure to improve stormwater quality;
 - c. Catchment management plans and their associated resource consents will use adaptive management approaches and techniques; and
 - d. CCC will provide opportunities for CRC to provide input throughout the development of catchment management plans.
20. It is acknowledged that the stormwater protocol is a non-statutory document. However, it has been signed by both Chief Executives and there is a real and agreed expectation that all staff involved will adhere to the principles and other aspects of the protocol.
21. I note, however, that the Protocol was last revised in 2011 and may benefit from an amendment to align it with the provisions of the new resource consent (if granted).

Christchurch City Council Surface Water Strategy and Three Waters Strategy

Surface Water Strategy 2009-2039

22. The CCC's Surface Water Strategy sets goals for surface water management in Christchurch. It includes an implementation programme, which focuses on where CCC can make the most difference and address the most pressing water quality and quantity issues. The extent of the implementation of the programme is dependent on decisions made in the Long-Term Council Community Plan (LTP) processes.
23. The goals are to:
 - a. Improve the water quality of our surface water resources;
 - b. Reduce the adverse effects of flooding;
 - c. Improve the ecosystem health of surface water resources;
 - d. Protect and restore Ngāi Tahu values associated with surface water resources;
 - e. Support a range of recreation activities on and around waterways;
 - f. Protect heritage values associated with surface water;
 - g. Protect and enhance the landscape values of surface water;
 - h. Support community involvement in surface water management;

- i. Manage stormwater in an efficient manner that supports Goals a – h.

Three Waters Strategy

24. In 2015, the Applicant commenced with the development of the Three Waters Strategy, which focuses on water supply, surface water and wastewater. The strategy is intended to provide guidance for informing other Council long-term plans, infrastructure strategies and management plans. The Three Waters Strategy will replace the Surface Water Strategy.
25. As of the writing of this report, the Three Waters Strategy has not been finalised.

Christchurch City Council Water Supply, Stormwater and Wastewater Bylaw 2014

26. The Applicant manages stormwater discharges into the stormwater network and activities that could affect the stormwater network using the CCC Water Supply, Wastewater and Stormwater Bylaw 2014 ('the Bylaw').⁴
27. The purpose of the Bylaw is to manage, regulate and protect from misuse or damage, the Council's water supply, wastewater and stormwater systems and to protect the public from nuisance and maintain public health and safety.
28. The Bylaw defined the stormwater system as including "both the primary and secondary stormwater systems including any facilities for the retention or treatment of stormwater", whereby a primary stormwater system is a "set of facilities and devices (e.g. pipes, drains, detention ponds, curb and channelling and waterways) either man-made or natural, which are used to convey stormwater, reduce the risk of flooding and to improve water quality." A secondary stormwater system is defined as "*any flow paths taken by stormwater when the primary stormwater system is over capacity and includes roads and overland flow paths*". Waterways are defined as including "*a watercourse (as defined in Section 2 of the Soil Conservation and Rivers Control Act 1941) and drainage channel (as defined in Section 503 of the Local Government Act 1974), and any open drain or waterway as defined in the relevant district plans and the regional plan prepared under the [RMA]*". Based on these definitions, any discharge directly to a natural or manmade waterway considered by CCC to form part of the stormwater network also constitutes a discharge to the stormwater network. I note that the definition of 'reticulated stormwater network' under the LWRP differs from the above definition of stormwater network.⁵
29. With regards to stormwater management, the Bylaw sets the following objectives:
 - (a) *To control the discharge of contaminants into the public stormwater system;*

⁴ Christchurch City Council (2014). *Christchurch City Council, Water Supply, Wastewater and Stormwater Bylaw 2014*. Christchurch, New Zealand. Accessible under: <https://ccc.govt.nz/assets/Documents/The-Council/Plans-Strategies-Policies-Bylaws/Bylaws/ChristchurchCityCouncilWatersupplyWastewaterandStormwaterBylaw2014.pdf>

⁵ Under the LWRP, 'Reticulated Stormwater Network' means: means a network of pipes, swales, drains, kerbs and channels owned or operated by a network utility operator that collects stormwater within areas used or proposed to be used for urban-residential, commercial or industrial purposes and conveys that stormwater to any device, wetland, retention or detention pond or infiltration basin for the treatment of stormwater, prior to a discharge to land, groundwater or surface water. It excludes any drainage system that has been constructed for the primary purpose of collection, conveyance or discharge of drainage water.

- (b) *To enable the Council to meet the relevant objectives, policies and standards for discharges from the public stormwater system;*
 - (c) *To protect the land, structures and infrastructure of the stormwater system;*
 - (d) *Prevent the unauthorised discharge of stormwater into the public stormwater system;*
 - (e) *Defining the obligations of the Council, installers, owners and the public in matters related to the discharge of stormwater and management of stormwater systems.*
30. The Bylaw sets out the requirements that need to be met for stormwater to be accepted into the public stormwater system, including gaining approval of the Council and meeting any minimum stormwater standard set under the Bylaw. The minimum stormwater standard may be developed and introduced by way of Council resolution and will be established with consideration of the views and preferences of persons affected by the decision.
31. The Bylaw also sets prohibited activities and restricted activities for actions that could significantly affect the integrity of the stormwater system or the quality of the stormwater discharge.
32. In summary, the Bylaw is an important tool to enable the Applicant to manage the effects of stormwater discharging into the environment via their network.

Long-Term Council Community Plan

33. The CCC's Long Term Plan 2018-28 proposes to spend approximately \$266 million for stormwater drainage capital programmes over the next decade, and \$385 million in stormwater drainage operating expenditure. In addition, almost \$400 million are proposed to be spent on flood protection and control works capital programmes, while approximately \$30 million are earmarked for operating expenditure.
34. The capital works range from small scale drainage upgrades to large scale stormwater devices across the district.
35. It is noted that LTP funding was not secured for the community initiative Community Water Partnership, a joint CCC, Zone Committee, Community and Environment Canterbury programme to improve waterways incorporating behaviour change, education and awareness initiatives. It is understood, however, that some of the initiatives anticipated by the Partnership will still go ahead and will be funded through alternative means.
36. With regard to the Community Water Partnership, I also highlight the Southshore Residents Association submission, which advocates for the resurrection of the Partnership, as well as more investment in education and community engagement.

NOTIFICATION

Overview

37. The initial application CRC160056 was requested to be publicly notified by the Applicant, which occurred on 29 January 2016 in the 'Akaroa Mail' and the 'Christchurch Star', and in 'The Press' on 30 January 2016. A total of 47 submissions were received.
38. With lodgement of the new resource consent application CRC190445 the Applicant requested public notification. The application was publicly notified on

3 August 2018 in the 'Akaroa Mail', on 4 August 2018 in 'The Press', and on 9 August 2018 in the 'Christchurch Star' with the following wording:

Applicant: Christchurch City Council

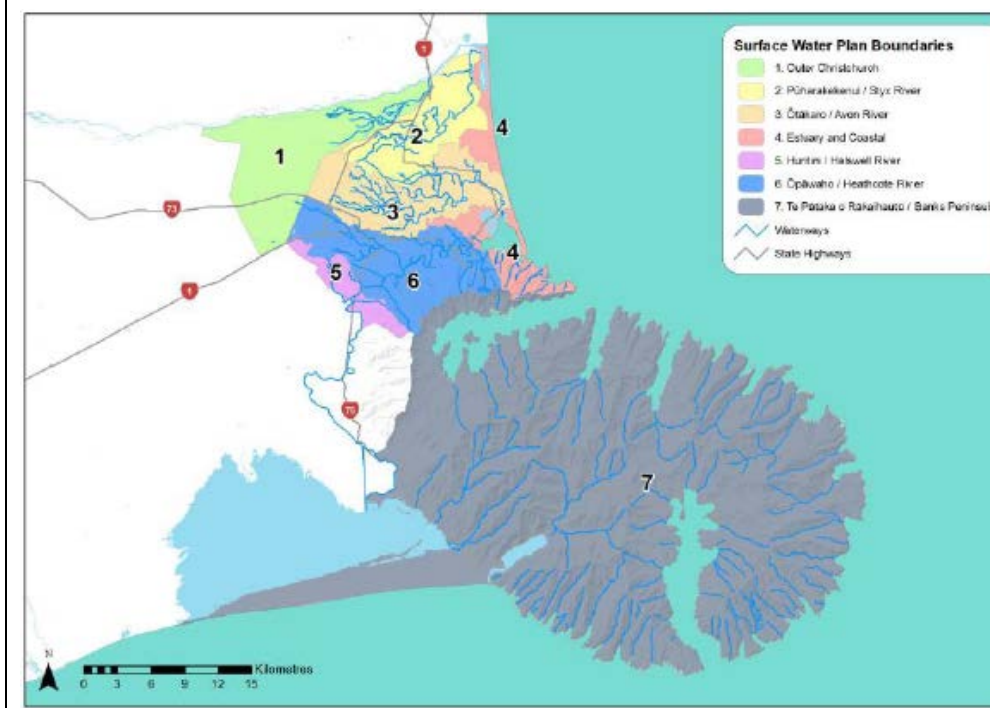
Address for service: Christchurch City Council, PO Box 73014, Christchurch 8154

Attention: Graham Harrington or email: CSNDC@ccc.govt.nz

CRC190445 – to discharge water and contaminants to land and water, including coastal water, from the existing and future reticulated stormwater network. This includes all existing and future reticulated networks within Christchurch City and the settlements of Banks Peninsula. The application provides for all discharges of stormwater into the reticulated network including from all construction sites, industrial sites and sites where hazardous industries or activities may be occurring. This application replaces application CRC160056, which was previously notified in 2016. The previous application excluded discharges from 'high risk sites'. CCC now propose to take responsibility for these 'high risk sites' within the scope of the resource consent from 2025 onwards.

The discharges will occur in accordance with Stormwater Management Plans that demonstrate the means by which the quality of stormwater discharges will be progressively improved and from which the proposed contaminant load reductions will be met, as well as setting specific objectives for the individual catchments. Stormwater Management Plans have already been prepared for the Ōtākaro/Avon River catchment, Pūharakekenui/Styx River and the part of the Huritini/Halswell River catchment that is located within the Christchurch City boundaries. Stormwater Management Plans will be prepared for the Ōpāwaho/Heathcote River by 30 June 2019, the Estuary and Coastal Areas and Outer Area Christchurch by 20 December 2019 and Te Pātaka o Rākaihautū/Banks Peninsula settlements by 20 December 2020.

A resource consent duration of 25 years is sought.



39. In addition to the public notice, a number of interest groups, individuals and organisations were served notice of the application. Further, parties who submitted on the original resource consent application CRC160056 were

notified of the new application via mail. A list of all parties served notice can be found at HPRM C18C/105850.

Submissions

40. During the submission period, a total of 39 submissions were received. Table 1 summarises the submissions:

Table 1 – Summary of submissions received

| Submissions | Total | Request to be heard | Request not to be heard |
|----------------------------------|-------|---------------------|-------------------------|
| All submissions | 39 | 30 | 9 |
| In support | 25 | 17 | 8 |
| In opposition | 6 | 6 | 0 |
| Neither in support or opposition | 8 | 7 | 1 |

41. The submissions in opposition raised the following matters (grouped and not listed in any particular order):
- There is too much uncertainty about the potential adverse effects over the duration sought of the resource consent;
 - Water quality will further decline;
 - Concerns about construction-phase discharges and sedimentation;
 - Lack of clearly defined targets and timeframes for implementation, and how the proposed targets will be met;
 - The flood models do not represent the real situation and the consent may exacerbate flood effects in the Lower Styx area;
 - Use of Residential Red Zone (RRZ) land for stormwater management;
 - Concern about the implications for the use of certain roofing materials and added compliance costs for landowners;
 - Lack of community consultation; and
 - Lack of clarity regarding the exclusion of sites and requirements for existing and new infrastructure.
42. The submissions in support comment on:
- The need to consider bird strike risks near the airport;
 - Uncertainties around expectations for HAIL and industrial sites;
 - Positive progression in improving water quality in the Ōtākaro/Avon River catchment and across the wider Christchurch City area;
 - Wish to be consulted during SMP development/review process.
43. The neutral submissions comment on:
- The need to consider the potential flood impacts in the Halswell in combination with land drainage associated with new development;
 - Uncertainties around responsibilities for drainage within and in the immediate vicinity of the Little River settlement area;
 - Provision for port stormwater discharges via CCC network;

- d. Insufficient clarity around management of development and redevelopment sites;
 - e. The Whakaraupō/Lyttelton Harbour catchment should be separate from the Te Pātaka o Rākaihautū/Banks Peninsula SMP with its standalone SMP;
 - f. Concerns around separation of stormwater discharges from transmission lines and/or structures;
 - g. Keep New Zealand Defence Force separate from CSNDC;
 - h. Consultation with Land Information New Zealand (LINZ) for any use of RRZ land for stormwater management purposes; and
 - i. Consultation with Ministry of Education (MoE) when stormwater facilities proposed on MoE land.
44. Refer to Appendix 9 for the complete submission summary.

DESCRIPTION OF THE PROPOSED ACTIVITY

Overview

- 45. This Section summarises the key aspects of the Applicant's proposal.
- 46. A description of the proposed activity can be found in Section 2 of the initial application CRC160056 (Pages 8-13), which, as requested by the Applicant in the letter received on 26 July 2018, forms part of application CRC190445.
- 47. The proposed conditions included in the application have been amended in the letter received from the Applicant on 9 July 2018.
- 48. The Applicant seeks resource consent to discharge water and contaminants to land and to water, including coastal water, from the stormwater network managed by CCC throughout Christchurch City and Banks Peninsula. This includes the existing stormwater network and new infrastructure constructed in the future within the boundary of the Christchurch District.
- 49. Until 31 December 2024, the Applicant proposes to exclude the following sites from the resource consent (if granted):
 - a. Any site or development area on the CRC's Listed Land Use Register (LLUR) that is considered by CCC to pose an unacceptably high risk of surface water or groundwater contamination;
 - b. Any stage of development with a total area of disturbance exceeding 5 ha on flat land or 1 ha on hill land; and
 - c. Any site listed on Schedule 1, which was attached to the proposed conditions.
- 50. To ensure consistency with Policy 4.16A of the LWRP, the Applicant proposes that the above sites fall within the scope of the CSNDC from 1 January 2025 onwards, unless an existing site-specific discharge permit expires past this date, whichever is the latest.
- 51. Therefore, from 2025 onwards, the discharges from the following sites will be included in the scope of the CSNDC:

- a. All discharges (operational and construction-phase) to the CCC reticulated stormwater network, as well as natural and manmade waterways considered part of the network (as defined in the SMPs)⁶;
 - b. Residential hardstand and roof stormwater discharged onto and into land within individual sites;
 - c. Non-residential roof stormwater discharges onto and into land within individual sites;
 - d. New non-residential hardstand stormwater discharges onto and into land within individual sites, including high-risk HAIL⁷ and industrial sites; and
 - e. All construction-phase stormwater discharges from non-HAIL and low-risk HAIL sites onto and into land within individual sites.
52. The discharges from the following sites will not be within the scope of the CSNDC (prior to and post 2025):
- a. All existing non-residential hardstand stormwater discharges from HAIL and non-HAIL sites onto and into land within individual sites; and
 - b. Construction-phase stormwater discharges from high-risk HAIL and industrial sites onto and into land within individual sites.

Stormwater Management Approach

53. The Applicant describes the approach as a way to improve the consistency of stormwater management across the district, provide more certainty for the wider community in the way stormwater will be managed and to simplify the administration of the resource consents for the stormwater networks for both CCC and CRC.
54. The key aspects of the proposed stormwater management approach are summarised in the following paragraphs.
55. Receiving Environment Objectives and Attribute Targets:
- a. Receiving Environment Objectives and Attribute Targets are proposed in Schedules 4 to 6 of the proposed conditions in relation to the effects of stormwater discharges on surface water quality and ecology, coastal water quality and ecology, groundwater quality and springs, and cultural values. The objectives are generally qualitative (e.g. Enhance ecological values; Enhance mana whenua coastal values; etc.), while the targets are quantitative (e.g. Minimum averaged Marine Cultural Health Index and State of the Takiwā scores: Score of 4).
 - b. As part of the Receiving Environment Objectives and Attribute Targets, the Applicant also proposes to mitigate the effects of the discharge of stormwater on water quantity, as measured by the Receiving Environment Objectives and Attribute Target Levels within Schedule 7.
56. Stormwater Management Plans (SMPs):
- a. Stormwater Management Plans (SMPs) are proposed to be developed and implemented for the seven catchments of the district. The application states that the SMPs will detail how stormwater management within each catchment will:

⁶ Refer to the definition of stormwater network under the Bylaw above.

⁷ Ministry for the Environment's Hazardous Activities and Industries List

- i. Progressively improve discharges to work towards achieving the Receiving Environment Objectives and Attribute Target Levels for waterways, coastal waters, groundwater and springs and water quantity, as set out in the proposed resource consent conditions and in Schedules 4 to 7 attached to the conditions;
 - ii. Continue to contribute to groundwater and spring-fed stream flows by discharging stormwater to land infiltration systems where reasonably practicable;
 - iii. Be a means to plan the works authorised by, and to implement the conditions of, the CSNDC as they apply to each catchment;
 - iv. Identify the mechanisms to be used to achieve compliance with the conditions of consent, and the mitigation methods to be used to meet the Receiving Environment Targets. Each SMP will include a Cultural Impact Assessment and will be prepared in collaboration with the Papatipu Rūnanga; and
 - v. Be reviewed every 10 years for the purpose of ensuring a holistic review is performed on every SMP at regular intervals to allow all changes made during that time to be collated and documented.
- b. Any draft new or amended SMP will be sent to Papatipu Rūnanga, the relevant Zone Committee(s) and Community Board(s) seeking feedback from these parties.

57. Implementation Plan:

- a. CCC also proposes to prepare an Implementation Plan within 12 months of granting the consent. The Implementation Plan is to be reviewed every three years, concurrently with the preparation of the CCC's LTP. The Implementation Plan is to include:
 - i. A list of proposed stormwater mitigation methods and devices;
 - ii. A programme of stormwater works for CCC and private development;
 - iii. A plan for regulatory, investigative, educational and preventative activities or programmes relating to stormwater discharges;
 - iv. Details of budgets for capital works or resourcing that is linked to the CCC's LTP; and
 - v. Reporting on any testing or water quality monitoring undertaken that is used to check the performance of facilities or to inform prioritisation of areas for mitigation.

58. Environmental Monitoring Programme:

- a. The applicant proposes an Environmental Monitoring Programme (EMP), to monitor the effects of the stormwater discharges and to determine progress towards achieving the Receiving Environment Objectives and Targets. The proposed EMP includes a range of different monitoring methods designed to monitor the impacts of discharges on soil quality, groundwater, surface water, instream sediment, aquatic ecology and Mana Whenua values.

59. Contaminant Load Model:

- a. The Applicant in conjunction with Golder Associates developed a city-wide CLM approach for setting and tracking contaminant load targets for the Styx, Avon, Heathcote and Halswell SMP catchments over the course of the resource consent duration. Resource consent conditions are proposed to be used in conjunction with the new strategic approach to the resource consent monitoring. The conditions address, among other things, how to adaptively manage the discharges over time and to constructively manage non-compliances should they occur.
- b. The CLM approach seeks to enable CCC to demonstrate a reduction of the key urban contaminants (TSS, Copper and Zinc) discharged to receiving water bodies and to predict the long-term impact of possible mitigation measures over the duration of the resource consent. The CLM is proposed to be used to demonstrate improvements in stormwater discharge quality in a manner that is consistent with the LWRP policies requiring network operators to work towards meeting water quality outcomes and standards.
- c. The CLM will be revised every 5 years to account for expected interventions and urban development.

60. Response to Monitoring and Modelling:

- a. The proposed response to adverse outcomes identified via monitoring (i.e. not meeting the Attribute Target Levels for TSS, copper, lead and zinc in surface water, as set out in Schedules 4 and 5, and copper, lead and zinc in groundwater, as set out in Schedule 6) is to:
 - i. Investigate whether this is due to the effects of stormwater network discharges and provide a summary of this investigation and the results to CRC;
 - ii. If the results determine the cause is a result of stormwater discharges, an assessment of options and a timeline for correction or remediation are to be provided. CRC will assess these options and determine if they are adequate; and
 - iii. If agreement between the Applicant and CRC cannot be reached, the Applicant proposes to consult with WIM and Papatipu Rūnanga to determine the actions to be undertaken.
- b. With regards to the response to the periodic modelling of contaminant loads, the proposed resource consent conditions specifically state that where CLM results show that the percentage reduction targets are not met, CCC will be in breach of the resource consent, and will undertake a number of investigations and assessments as follows:
 - i. Investigate the reasons for not achieving the modelled contaminant load reductions and describe what measures will be implemented (if necessary) to improve stormwater discharge quality;
 - ii. Assess whether reasonable endeavours to mitigate the adverse effects of stormwater have been carried out;
 - iii. If the assessment determines that reasonable endeavours have not been carried out, assess options for correction / remediation to mitigate any adverse effects, and provide a timeline for the correction / remediation (if necessary); and

- iv. Prepare and provide to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, a report detailing the matters set out above.
 - c. The monitoring and modelling results are to be collated and reported to CRC annually in an annual report. The annual report is also proposed to contain:
 - i. A summary of consultation undertaken;
 - ii. An updated list of sites excluded from the consent until 1 January 2025;
 - iii. An update on the progress of actions identified in the Implementation Plan;
 - iv. A report on any consultation with Papatipu Rūnanga; and
 - v. The results of any additional monitoring and investigations undertaken beyond those specified in the EMP (for example Industrial Site Audits, or investigations on the efficacy of treatment devices).
 - d. The proposed resource consent conditions also include some General Conditions that apply in areas/catchments for which no SMP has been prepared until one is developed. These conditions specify the thresholds for when water quantity and quality treatment is required and in some instances the type of the mitigation to be used.
61. Protection of domestic supply bores:
- a. The Applicant proposes conditions that specifically require separation of new stormwater infiltration facilities from domestic drinking water supply wells, or effects assessments if facilities are within these setbacks. These proposals aim to ensure that domestic supply bores are not adversely affected by the discharges.
62. Consultation with Ngā Rūnanga and other stakeholders:
- a. The Applicant proposed conditions requiring the involvement of, and seeking feedback from, Papatipu Rūnanga, the relevant Zone Committee(s) and the relevant Community Board(s) during the development and review of SMPs.
 - b. Further, involvement of Papatipu Rūnanga is required during the preparation of the Implementation Plan and the annual planning of stormwater works. The conditions also require CCC to engage Papatipu Rūnanga at concept design stage for the installation of stormwater treatment facilities and devices with regard to wāhi tapu and taonga, and that CCC provides Mahaanui Kurataiao Ltd with quarterly reports, and Papatipu Rūnanga with annual reports.
 - c. The Mana Whenua Attribute Target Levels were proposed to be updated through consultation with Rūnanga representatives during July 2018; however, no information on outcomes of this consultation has been provided to CRC prior to finalising this Section 42A report.

Description of the Stormwater Network

63. The Applicant has described the current stormwater network in Section 3.4 of the application (Pages 29-30). In summary, the network encompasses the following:

- a. Waterways, including the rivers and tributaries and riparian planting serving a land drainage purpose;
 - b. Waterway structures such as stopbanks, flood gates, weirs, retaining walls and water level control structures;
 - c. Utility waterways including lined and unlined drains;
 - d. Piped reticulation used to collect and transport stormwater;
 - e. Pump stations to control water levels and assist with the removal of stormwater from low lying areas;
 - f. Detention and treatment devices such as detention basins, soakage basins, swales and sedimentation basins; and
 - g. Hydrometric devices which include rain gauges, groundwater boreholes, telemetry equipment, stilling wells and data loggers.
64. For the sake of clarity, the Applicant is not proposing to include:
- a. Discharges from public roads outside of the settlement areas (i.e. rural roads);
 - b. Discharges of wash down water that enters the stormwater system;
 - c. Discharges of wastewater entering the stormwater system from the CCC's reticulated wastewater network during wet weather overflow events;
 - d. Discharges of dewatering water; and
 - e. Discharges of spilled or deliberately released hazardous substances.

Nature of the Discharge

Urban Stormwater Contaminants and Sources

65. The Applicant has described the key contaminants likely to be present in stormwater based on the CCC's Waterways Wetlands and Drainage Guide (WWDG), including suspended solids, nutrients, hydrocarbons, metals and microbes. The impact of these contaminants on surface water quality can result in the following:
- a. Suspended solids which can reduce light levels and smother bed substrate and increase Biochemical Oxygen Demand (BOD).;
 - b. Nutrients which can increase nuisance plant growth and BOD;
 - c. Hydrocarbons which can cause oxygen depletion of waters;
 - d. Metals which can impact on the physiology of plants and cause chronic and acute effects on animals; and
 - e. Microbes which can affect human health.
66. The CCC's WWDG characterises the likely contaminant concentrations in run-off drawn from various New Zealand data. Contaminant loads are typically greater in sub-catchments with commercial and industrial land uses and from roads carrying higher vehicle numbers.
67. A study has been completed by the University of Canterbury in 2016 to investigate the sources and loads of contaminants in stormwater in the

Addington Brook catchment to determine what interventions could result in improved water quality⁸. The findings of the report have shown:

- a. Total Suspended Solids (TSS) is the largest component of the contaminant load with car parks contributing the greatest combined load when compared to roads and roofs.
 - b. Zinc is the second largest component of the contaminant load in run-off with 66% of zinc arising from impermeable surfaces such as roofs, 15% from roads and 19% from car parks. Between 89% and 100% of zinc from roofs is in a dissolved form.
 - c. Copper was sourced primarily from major arterial roads and carparks.
68. CRC Senior Scientist (Surface Water Quality and Ecology) Ms Michele Stevenson further considers that the following contaminants (either entrained or dissolved) are also present in stormwater runoff:
- a. Organic matter which has the potential to have a significant influence on dissolved oxygen concentrations;
 - b. Rubbish (gross pollutants) which has a significant influence on aesthetics;
 - c. A wide range of other potential 'contaminants of concern' (CoC), including hazardous substances, that may enter the stormwater network through poor site management practices at industrial or commercial premises, or from earthworks on contaminated land.
69. With regard to discharges from HAIL sites, CRC Principal Science Advisor (Contaminated Sites) Mr Rowan Freeman highlighted in his technical review of the Applicant's AEE that a fair proportion of land within the SMP catchments, particularly within Christchurch City, hold HAIL activities (approximately 5.7% of the total catchment area of Christchurch and Banks Peninsula and approximately 19% of Christchurch City). Mr Freeman notes that although any HAIL activity may pose a risk to environmental receptors if not adequately monitored and managed, some HAIL activities are inherently risky and require a higher level of vigilance. In summary, any HAIL activity where heavy metals, petroleum hydrocarbons (including polycyclic aromatic hydrocarbons), and chlorinated compounds have been or are currently being used may pose a high risk if discharges are not appropriately managed, as these contaminants can be transported in stormwater systems while entrained with or adsorbed to sediment or while dissolved in stormwater.

Proposed Contaminant Loads and Response to Modelling

70. CLM has been completed for the Pūharakekenui/Styx River, Ōtākaro/Avon River, Ōpāwaho/Heathcote River and the Huriitini/Halswell River. Contaminant loads for the four catchments were modelled based on estimated contaminants generated on an annual basis per square metre of each land use type. The CLM used contaminant loads presented in the Auckland Regional Council (ARC) Contaminant Load Model User Guide⁹ and in the Avon River Ōtākaro Stormwater Management Plan, Contaminant Load Modelling Assessment¹⁰.

⁸ Charters, F. (2016). *Stormwater Contaminant Load Monitoring and Modelling of the Addington Brook Catchment*. University of Canterbury, Christchurch.

⁹ ARC (2011). *The Contaminant Load Model. User's Manual*. Auckland Regional Council Technical Report 2010/04.

¹⁰ Golder (2014). *Avon River Ōtākaro Stormwater Management Plan, Contaminant Load Modelling Assessment – Final Report*. Report No. 137811041_007_R_Rev1

71. Each catchment was divided into source areas and sub-categories (i.e. grass land, roofs by material, roads by vehicle trips, paved hardstand by land use, and construction sites), and annual contaminant yields were assigned to each sub-category.
72. The contaminant loads in urban catchments for the modelled scenarios are summarised in Table 2. These values include the treatment provided currently and proposed to be provided over the next 35 years based on projected development.

Table 2 – Modelled contaminant loads for ‘Best Practice’ scenarios

| Scenario | Year | Total load without treatment | Total load post-treatment | Percentage removed ³ |
|---|--------|------------------------------|---------------------------|---------------------------------|
| TSS (t/year) | | | | |
| Base Case ¹ | Jan-17 | 6,657 | 5,857 | 12% |
| 5-year | Jan-22 | 6,642 | 5,266 | 21% |
| 10-year | Jan-27 | 6,619 | 4,984 | 25% |
| 35-year | Jan-52 | 6,546 | 4,660 | 29% |
| COPPER (kg/year) | | | | |
| Base Case | Jan-17 | 4,444 | 3,751 | 16% |
| 5-year | Jan-22 | 4,387 | 3,362 | 23% |
| 10-year | Jan-27 | 4,328 | 3,132 | 28% |
| 35-year | Jan-52 | 4,045 | 2,775 | 31% |
| ZINC (kg/year) ² | | | | |
| Base Case | Jan-17 | 30,925 | 27,815 | 10% |
| 5-year | Jan-22 | 30,239 | 25,679 | 15% |
| 10-year | Jan-27 | 29,180 | 24,058 | 18% |
| 35-year | Jan-52 | 23,978 | 18,995 | 21% |
| ¹ The ‘Base Case’ is described as the ‘January 2017 situation’. ² Modelled Zinc load and reduction with ‘Best Practice’ routine roof replacement effect. ³ Compared to total load without treatment. | | | | |

73. The proposed conditions (July 2018 version) also include a 25-year scenario; however, I note that the contaminant reduction targets for this scenario have not been included in the CLM report. The Applicant confirmed that the 25-year scenario has been derived from the linear correlation between the 10-year and 35-year scenarios.
74. The contaminant load reductions are proposed to be included as targets in the resource consent conditions (refer to Proposed Condition 16). Responses to the modelling are outlined in Proposed Conditions 49 and 50.

Stormwater Mitigation Methods

75. The Applicant has described the methods proposed to manage the effects of stormwater discharges in Section 9 of the application (Pages 135-149). To summarise, these methods involve:
- Greenfields development – The use of a range of treatment devices in accordance with industry best practice. These systems are generally installed by land developers and vested to CCC. As a minimum, first flush treatment and attenuation of the post-development two percent Annual Exceedance Probability Event will be required. Possible treatment devices could include wetlands, dry infiltration basins, rain gardens, proprietary filtration devices, swales, wet ponds, etc.
 - Retrofitting in built-up areas – The proposed conditions include criteria for determining whether redevelopment is of sufficient scale to warrant the installation of treatment devices. Due to space constraints, devices are generally smaller with higher costs such as proprietary filtration devices or rain gardens.

- c. Christchurch Hill areas – The focus is generally on the management of increased run-off and erosion. Larger scale developments are required to provide full first flush treatment. Robust erosion and sediment control is required and the current SMPs require rainwater storage on individual sites.
- d. Te Pātaka o Rākaihautū/Banks Peninsula settlements – Due to space constraints and the topography, street scale rain gardens could be installed and proprietary filtration devices at the end of pipe.
- e. Construction Phase Discharges – Proposed mitigation includes:
 - i. A requirement for Erosion and Sediment Control Plans (ESCPs) prepared in accordance with the CRC Erosion and Sediment Control Guidelines 2007 for all ‘development areas’ (i.e. any individual area within a site or sites that is undergoing construction and/or earthworks activities but excludes sealed pavement repair where base course is not exposed. These measures will be inspected by the subdivision engineers);
 - ii. Identification of proposed monitoring and maintenance of erosion and sediment control measures prior to site clearance and during construction;
 - iii. Monitoring of small scale erosion and sediment control measures by building consent inspectors;
- f. Management of Industrial Sites – A city wide auditing process of potentially high-risk sites will be undertaken via a desktop screening. Site visits will then be undertaken, and the Applicant will work with any site owners to ensure that stormwater quality can meet the required treatment standard, i.e. be of a discharge quality that is similar to that expected from residential or commercial sites. All industrial sites will be included within the scope of the CSNDC from 2025 onwards unless individual sites have an existing discharge permit that expires at a later date.
- g. Contaminated Sites – The resource consent will not cover discharges into land within the site during construction on a contaminated site or from sites that the Applicant and/or CRC identify as having a high risk of resulting in adverse effects on groundwater or surface water.
- h. Management of Flood Risk – The Applicant states flood modelling will be required for larger developments and that this modelling needs to be undertaken in accordance with CCC modelling specifications. There are a number of flood models currently developed and these can be used to predict flood effects and show compliance with objectives regarding preventing the exacerbation of flooding effects. The models are calibrated using data obtained from the EMP.
- i. Investigations – When monitoring or modelling results indicate that the resource consent conditions are not being met, the Applicant proposes investigations to identify the reasons and to determine whether additional mitigation or remedial measures are required to address adverse effects.
- j. Non-infrastructural approaches to Stormwater Management – There are a number of non-structural methods the Applicant is currently undertaking or proposes to undertake to address stormwater

management that do not require the construction of infrastructure. These includes:

- i. Joint monthly meetings between CCC and CRC technical staff to provide support for addressing stormwater issues;
 - ii. Investigations into alternative modelling approaches and mitigation measures;
 - iii. Education campaigns, advertising and community engagement programmes;
 - iv. Liaison with industry groups to educate and raise awareness of stormwater effects and their prevention; and
 - v. Developing and implementing minimum water quality standards for discharges into the reticulated network through the Water Supply, Stormwater and Wastewater Bylaw 2014; and
- k. District Plan Flood Management Provisions – The District Plan includes provisions that identify flood areas to prevent development in these high-risk zones or to address the potential effects of flooding.

LEGAL AND PLANNING MATTERS

The Resource Management Act 1991 (RMA)

76. Section 15 of the RMA states that:

- (1) *No person may discharge any—*
 - (a) *Contaminant or water into water; or*
 - (b) *Contaminant onto or into land in circumstances which may result in that contaminant (or any other contaminant emanating as a result of natural processes from that contaminant) entering water; or [...]*
 - (d) *Contaminant from any industrial or trade premises onto or into land— unless the discharge is expressly allowed by a national environmental standard or other regulations, a rule in a regional plan as well as a rule in a proposed regional plan for the same region (if there is one), or a resource consent.*
- (2) *No person may discharge a contaminant [...] into or onto land, from a place or any other source, whether moveable or not, in a manner that contravenes a national environmental standard unless the discharge—*
 - (a) *Is expressly allowed by other regulations; or*
 - (b) *Is expressly allowed by a resource consent; or*
 - (c) *Is an activity allowed by section 20A.*
- (2A) *No person may discharge a contaminant [...] into or onto land, from a place or any other source, whether moveable or not, in a manner that contravenes a regional rule unless the discharge—*
 - (a) *Is expressly allowed by a national environmental standard or other regulations; or*
 - (b) *Is expressly allowed by a resource consent; or*
 - (c) *Is an activity allowed by section 20A.*
- (3) *This section shall not apply to anything to which section 15A or section 15B applies.*

77. There is no National Environmental Standard (NES) permitting the proposed stormwater discharges. Therefore, a resource consent (discharge permit) is

required if the proposed stormwater discharges cannot comply with the relevant regional rules.

Regional Plans

Overview

78. At the time of lodgement, the regional plans relevant to this proposal were:
- a. The Land and Water Regional Plan (LWRP);
 - b. The Waimakariri River Regional Plan (WRRP); and
 - c. The Regional Coastal and Environment Plan (RCEP).

Land and Water Regional Plan

Overview

79. The Land and Water Regional Plan (LWRP) provides a direction that existing reticulated stormwater network operators are required to apply for resource consents to authorise discharges of stormwater from their networks.
80. The provisions of the LWRP also generally seek:
- a. Reticulated network operators to manage all discharges of stormwater that enters, and is conveyed by, the stormwater system in accordance with stormwater management plans;
 - b. The use of land based or designed treatment systems to manage the quantity and/or quality of discharges to meet the outcomes sought by the LWRP; and
 - c. Where the discharge is from an existing local authority network, demonstrate a commitment to progressively improve the quality of the discharge to meet the LWRP water quality outcomes, standards and targets as soon as practicable but no later than 2025.

Network Discharges

81. The relevant rules for the discharge of stormwater from a reticulated network are Rule 5.93 and Rule 5.94 of the LWRP¹¹.
82. The Applicant has not supplied stormwater management plans for all of the catchments as required under Condition 1. The Applicant further states that not all discharges comply with the Schedule 8 water quality standards (Condition 2). The Applicant therefore considers the discharge of stormwater from the reticulated network a **non-complying activity** under Rule 5.94 of the LWRP.
83. I agree with the Applicant's assessment, noting that the amended application was received after 30 June 2018 as required under Condition 3.

Developed-phase Discharges to Surface Water and Onto or Into Land from Individual Sites

84. The Applicant also proposes to include within the CSNDC all roof stormwater discharges into land within individual sites (e.g. roof runoff via soak pits) as well as stormwater generated from hardstand areas within existing residential sites, greenfield development and re-development sites (residential and non-residential, including low-risk and non-HAIL sites) that is discharged into land

¹¹ Note that the LWRP definition of reticulated stormwater network differs from the CSNDC definition of stormwater network

within these sites. Hardstand runoff discharges into land from existing high-risk HAIL and industrial sites are not included within the scope of the CSNDC application.

85. The applicable rules in the LWRP are Rules 5.95 to 5.97. While a large number of these discharges may be able to meet the permitted activity rules' conditions (Rules 5.95 and 5.96), there is no certainty around the overall compliance with the permitted activity rule conditions. On this basis, I consider that the discharges to surface water and onto or into land within individual sites should be considered a **non-complying activity** under Rule 5.97.

Construction-phase Stormwater Discharges

86. The Applicant seeks to include stormwater discharges from development sites, which means any individual area within a site or sites that is undergoing construction and/or earthworks activities but excludes sealed pavement repair where base course is not exposed. Only discharges to the CCC network and discharges onto and into land from low-risk and non-HAIL sites are sought to be included, while all discharges from high-risk HAIL and industrial sites onto or into land within individual sites are not within the scope of the CSNDC.
87. The applicable rules in the LWRP are Rules 5.94A and 5.94B. While a large number of these discharges may be able to meet the permitted activity rule conditions (Rule 5.94A), there is no certainty around the overall compliance with this rule. On this basis, I consider that the construction-phase stormwater discharges to the reticulated stormwater network from individual sites are a **restricted discretionary activity** under Rule 5.94B.

Waimakariri River Regional Plan

88. Pursuant to Section 27 of the Canterbury Earthquake Recovery Act 2011 (CER Act), the WRRP was amended in relation to the Pūharakekenui/Styx River catchment. The amendment specified that the NRRP applied in the catchment instead of the WRRP in relation to water quality. As the NRRP is no longer operative, the LWRP rules apply to determine if an activity requires consent.
89. The water quality provisions of the WRRP are, however, still applicable to the 'Outer Christchurch' sub-catchment that is covered under the WRRP.
90. With regard to the CSNDC, the WRRP therefore applies to:
- a. Water quality and quantity aspects within the Ōtukaikino catchment – Under Rule 6.2 of WRRP, the discharge of stormwater to water and into land where a contaminant may enter water is a **non-complying activity** as the discharge cannot meet the conditions of the relevant NRRP rule (WQL8), which is attached to, and therefore forms part of, the WRRP. I also consider the water quality standards may not be met.
 - b. Water quantity aspects within the Pūharakekenui/Styx River catchment – Considering water quantity aspects in isolation, the Applicant has addressed the proposal under Rule 5.2 of WRRP, which states any discharge of water into the Waimakariri River is a **discretionary activity** as there is no permitted activity rule for stormwater network discharges in the NRRP rule. I agree with this assessment. I also note that Rule 5.2 of the WRRP applies to both the network discharges and discharges into land within existing and future individual sites.

Regional Coastal and Environment Plan (RCEP)

91. Rule 7.1(b) and (f) of the RCEP provide for the discharge of stormwater into the coastal environment as a permitted activity. The Applicant cannot determine if the discharge would meet the permitted activity standards related to the coastal water quality beyond the relevant mixing zones, as there is insufficient monitoring data available to ascertain compliance or non-compliance with these standards. The Applicant therefore considers the discharge a **non-complying activity** under Rule 7.5. I agree with this assessment.

Summary

92. Due to the overlapping of the LWRP and WRRP in the Outer Christchurch sub-catchment and given the reticulated stormwater network is proposed to be managed under one comprehensive resource consent, I consider that applying a bundling approach is appropriate and that the most restrictive activity status is applied to all discharges.
93. The proposal to discharge stormwater from the reticulated network is therefore considered overall a **non-complying activity**.

CONSULTATION

94. The Applicant has described the consultation that has been undertaken in Section 11 of the application (Pages 152-155).
95. The Applicant states that the following parties were, or are continued to be, consulted with:
- a. Landowners in the South West and Pūharakekenui/Styx River catchments where stormwater treatment facilities were located;
 - b. CWMS zone committees and the community boards;
 - c. Ngāi Tahu and the Papatipu Rūnanga;
 - d. CRC via SWAT and WIM.
96. The Applicant states that future consultation will be undertaken with the CWMS zone committees, community boards and the Papatipu Rūnanga to obtain feedback on the development and reviews of SMPs.
97. During the preparation of the application, there were several meetings held between the CCC and CRC officers. This included technical staff who discussed the proposed conditions and monitoring programme. Prior to lodgement, consensus was reached between staff involved in the discussions on the general approach of the consent and how the effects could be mitigated or managed. Further meetings have been held during the consenting process to discuss the proposal and the future management of stormwater.
98. I understand that during the development of the Ōtākaro/Avon, South West and Pūharakekenui/Styx SMPs, several consultation initiatives occurred regarding the content of those documents. The Applicant has not provided any specific details regarding the nature or outcome of this consultation or who it involved.
99. With the further information received on the initial application CRC160056 on 9 July 2018, the Applicant provided an update on consultation with Papatipu Rūnanga, stating that progress has been made on the development of Cultural Impact Assessments, with only the Huritini/Halswell catchment CIA yet to be finalised. It was also highlighted that CCC and Papatipu Rūnanga have almost

finalised an agreement regarding the proposed conditions and the submission made by the Ngāi Tahu parties on the initial application CRC160056.

DESCRIPTION OF THE RECEIVING ENVIRONMENT

Summary of the Affected Environment

100. The Applicant has provided a description of the affected environment in Section 3 of the AEE (Pages 15-75), which accompanied the application.
101. The key aspects of the receiving environment can be summarised as follows:
 - a. There are three main geographic and land use areas within the CCC jurisdiction, flat land, hill areas (Port Hills) and Te Pātaka o Rākaihautū/Banks Peninsula.
 - b. Surface water bodies include spring-fed rivers and streams, the Waimakariri River and hill-fed Banks Peninsula waterways.
 - c. The water quality of waterways varies greatly across the city. Some areas have high water quality and ecological values such as the Ōtukaikino while other areas are severely degraded with compromised recreational and mahinga kai values.
 - d. The rivers of the flat lands of Christchurch City have a spring-fed flow base and relatively small catchments that respond quickly to local rainfall, which can cause flooding beyond river channels.
 - e. Flooding has been exacerbated in the city since the Canterbury Earthquakes of 2010 and 2011 as a result of soft ground settling.
 - f. Sea level rise is also a significant issue and CCC is planning for the possibility of a 1.0 m sea level rise by 2115.
 - g. The hill areas receive higher rainfall and combined with the steep terrain can result in high velocity flood flows that can damage infrastructure and threaten life and property. Flooding of the streams and rivers in the valleys also occurs.
 - h. Flooding in Te Pātaka o Rākaihautū/Banks Peninsula varies. Again, with higher rainfall and steep terrain, low lying settlements are vulnerable to short duration, high intensity storms.
 - i. The coastal environment receiving discharges from reticulated stormwater networks is diverse and includes the Ihutai/Avon-Heathcote Estuary, Whakaraupō/Lyttelton Harbour, Akaroa Harbour and the open coast between the Waimakariri River and the Scarborough Heads. The Ihutai/Avon-Heathcote Estuary supports a number of species, has significant recreational and cultural values and has already been negatively impacted by urbanisation. Whakaraupō/Lyttelton Harbour and Akaroa Harbour have large intertidal areas and support a diverse range of birds and fish species. Both harbours have significant cultural values and are vulnerable to sedimentation.
 - j. There are two key lake environments that make up the receiving environment for stormwater network discharges. Te Roto o Wairewa/Lake Forsyth and Te Waihora/Lake Ellesmere. Both lakes have significant cultural values, have no permanent outlets to the sea or streams and have compromised water quality.

- k. Soils within the city range from well drained to very poorly drained. Soils on the Port Hills and Te Pātaka o Rākaihautū/Banks Peninsula tend to be poorly draining loess soils that are highly vulnerable to erosion.
 - l. The flat lands overlie unconfined/semi-confined and the coastal confined gravel aquifer systems. Groundwater/water table depth varies with groundwater deeper in the west than the east.
 - m. Springs are located throughout the flat lands with all four of the city's main rivers being spring-fed.
 - n. The majority of the flat lands are within the Christchurch Groundwater Protection Zone. This zone relates to the area where activities can influence the quality of groundwater, which is a high quality untreated source of drinking water.
 - o. In Te Pātaka o Rākaihautū/Banks Peninsula, shallow aquifer systems are confined to the coastal margins, particularly in valley floors and a number of springs and wetlands exist in this area.
 - p. Drinking water in Christchurch is sourced from groundwater, mostly from the confined aquifer system but in the west of the city wells are screened in the unconfined/semi-confined gravel aquifer. On Banks Peninsula there is a mixture of groundwater and surface water sources for community supply.
 - q. Cultural values:
 - i. The waterbodies, including lakes and the coastal environment plays a central role in the culture, traditions and identity of Ngāi Tahu; and
 - ii. Springs are wāhi tapu to Ngāi Tahu.
 - r. There are six Papatipu Rūnanga (administrative council of the Ngāi Tahu hapū) within the CCC district:
 - i. Te Ngāi Tūāhuriri Rūnanga;
 - ii. Te Hapū o Ngāti Wheke/Rāpaki Rūnanga;
 - iii. Te Rūnanga of Koukourārata;
 - iv. Ōnuku Rūnanga;
 - v. Wairewa Rūnanga; and
 - vi. Te Taumutu Rūnanga.
 - s. The waterbodies, including lakes and the coastal environment plays a central role in the culture, traditions and identity of Ngāi Tahu.
102. CRC experts and external consultants, as noted above, have reviewed the Applicant's assessment of the receiving environment and have provided some further comments on the receiving environment in their Section 42A reports.
103. Of the further comments, I highlight CRC Senior Scientist (Surface Water and Ecology) Ms Michele Stevenson's and CRC Senior Scientist (Coastal Water Quality and Ecology) Dr Lesley Bolton-Ritchie's comments, which note:
- a. There is a lack of information included on the surface water quality and ecology of some of the other receiving environments, even where data are available that has been collected by other organisations such as Environment Canterbury.

- b. The current state of natural wetlands that receive stormwater discharges has not been described.
 - c. An updated summary of the current state analysis table (Table 1) was provided by Ms Stevenson to provide an indication of the current state of the receiving waterways by catchment. The data presented can be considered representative of the range of water quality conditions that the resident aquatic biota would be exposed to over time (i.e. chronic conditions).
 - d. Of the coastal areas within the district managed by the CCC it is the estuary that is likely to be the most impacted by stormwater discharges. This is because of the number of sources of stormwater to the estuary, i.e. rivers, streams, drains and direct discharges, the extent of urbanisation within the estuary catchments and the enclosed nature of the estuary with an approximately 250 m wide channel opening to the open coast.
 - e. There is little information available in general on the stormwater contribution to water quality in Brooklands Lagoon. The lagoon is classified under the RCEP as an Area of Significant Natural Value with particular values being Maori cultural values, protected areas, wetlands, estuaries and coastal lagoon, marine mammals and birds, ecosystems, flora and fauna.
 - f. In harbours around Banks Peninsula, stormwater has contributed to the accumulation of contaminants, such as metals and organic matter, in the seabed sediment in proximity to stormwater outlets, although little is known about the impacts of stormwater on Banks Peninsula coastal receiving environments.
 - g. The RCEP classifies the water within Whakaraupō/Lyttelton Harbour as either Coastal AE or Coastal CR or Coastal SG. The water within Akaroa Harbour is classified as either Coastal CR or Coastal SG.
 - h. Stormwater discharges can affect the microbial water quality at Akaroa main beach.
 - i. Since lodgement of the initial application CRC160056, approximately the inner two-thirds of Whakaraupō/Lyttelton Harbour has become a mātaītai.
104. In summary, based on the freshwater and coastal water quality and quantity outcomes set in the relevant regional plans that are required to be met, I consider that the receiving groundwater, surface water and coastal water environments are sensitive to both quality and quantity of stormwater discharges.

Existing Environment

105. For the purposes of Section 104 of the RMA, the decision maker on a consent application is concerned with the effects on the 'environment' as defined in Section 2 of the RMA. The starting point is to identify the relevant environment against which the effects of the proposal (as set out in the application) should be assessed.
106. The Applicant provided a discussion around the existing environment in the response to the additional questions for the original application CRC160056 in June 2016. In summary, the Applicant states that:

The discharge from the urban stormwater system into waterways around Christchurch has been lawfully occurring for many decades. It would be irrationally artificial to treat the "receiving environment" as not including the effects of those discharges. That would not be a "real world" analysis.

107. I also note that the Avon-Ōtākaro Network submitted on resource consent application CRC190445, stating that in the context of scale and significance of the proposal's overall potential adverse effects on the receiving environment "*the reference point for any test of adverse effects on the receiving environment must be its indigenous state not its current state*". This point was also made in the combined submission of river car networks.
108. The leading case on what constitutes the "environment" for the purposes of Section 104 of the RMA remains the Court of Appeal's decision in *Queenstown Lakes District Council v Hawthorn Estate Limited*.¹² In this case, the Court found that the 'environment' is the physical environment as it exists at the relevant time, which includes the future state of the environment as it may be by the implementation of resource consents that have been granted at the time a particular application is considered, where it appears that those resource consents are likely to be implemented.¹³ The 'environment' also includes the effects of future, non-fanciful, permitted activities beyond the subject site.¹⁴
109. I agree with the Applicant that a "real world" approach is required, particularly given that in context of stormwater discharges from the CCC's reticulated stormwater network, determining what constitutes the existing environment is rather complex. However, I understand that there has been some uncertainty as to how *Hawthorn* (which was decided in the context of district plan consents) applies in the context of resource consent granted by a regional council, given that regional resource consents will generally have an expiry date and their renewal is not guaranteed, despite Section 124 of the RMA.
110. Given this uncertainty and complexity, the CRC sought legal advice on how the 'environment' should be interpreted in the context of the CSNDC proposal. A copy of the Memorandum of Advice received is attached as Appendix 10.
111. The legal advice traverses a number of decisions addressing this matter, including the High Court decision of *Ngati Rangi Trust v Manawatu-Whanganui Regional Council* and concludes that the "environment" should be considered as if discharges under the existing consents that are to be replaced by the CSNDC have been discontinued and the CSNDC is an application for a new activity, unless the Applicant can establish that it is not feasible to do so. However, the environment is not to be considered as if discharges under the existing consents never occurred. Rather, the environment will include any legacy effects of past lawful discharges. This recognises the reality that the receiving waterbodies are, for the most part, heavily modified and have been for some years. For completeness, the existing environment does not include discharges from existing unlawful activities.
112. Determining which parts of the CCC's reticulated stormwater network are consented is required to determine what is lawful and what is not. This in itself is complicated.
113. CCC hold the following existing stormwater discharge permits (refer to 'Existing Resource Consents' section above):

¹² *Queenstown Lakes District Council v Hawthorn Estate Limited* (2006) 12 ELRNZ 299.

¹³ *Queenstown Lakes District Council v Hawthorn Estate Ltd* (2006) 12 ELRNZ 299; *Royal Forest and Bird Protection Society of New Zealand Inc v Buller District Council* [2013] NZCA 496.

¹⁴ *Far North District Council v Te Runanga-a-iwi o Ngati Kahu* [2013] NZCA 221 at [79].

- a. CRC000315 for discharges from residential, commercial and industrial roofing and residential hardstand areas from individual properties within parts of Christchurch City. The consent expires in 2034.
 - b. CRC090292 for discharges to surface water from roofs, hardstand areas and pervious areas from developed sites and during construction of some development sites within the Avon, Estuary, Halswell, Ōtukaikino and Styx catchments. Some high-risk sites were excluded from this consent. This consent expires in June 2016, although the applicant is entitled to continue to exercise the existing discharge permit in accordance with Section 124.
 - c. CRC120223 for discharges into land and to water from roofs, roads and hardstand areas and from development areas during construction phase within the South West area of Christchurch. Some high risk contaminated sites or commercial/industrial sites are excluded along with large-scale construction phase discharges. The consent expires in 2047.
 - d. CRC131249 for discharge into land or to surface water or groundwater from roofs, roads, hardstand areas and from development areas during the construction phase within the Pūharakekenui/Styx River catchment. Some high risk contaminated sites or commercial/ industrial sites are excluded along with large-scale construction phase discharges. This consent expires in 2048.
114. Individual properties or development areas may also hold individual resource consents, which can be privately held or vested to CCC. These resource consents may be for discharges onto or into land, into surface water or into the reticulated network. In addition to this, a number of discharges from private properties that do not occur via the reticulated network are permitted activities.
115. The Applicant states that:
- A real world analysis of the 'receiving environment' against which the effects of the proposed activity is to be assessed includes the waterways as they are at the time of the hearing, including the effects of lawful discharges into the rivers as either permitted activities or under resource consents, and including the effects of any unimplemented resource consents that are likely to be implemented.*
116. The Applicant considers that this includes the effects of the current discharges under the existing discharge permits CRC090292, CRC120223 and CRC131249.
117. I consider that assessing the CSNDC as if the existing stormwater discharge permits were not part of the 'existing environment' would allow for a more thorough assessment of effects and, in light of the lack of knowledge about the actual contribution of stormwater discharges on part of the receiving environment (i.e. coastal water, as discussed above), would follow the precautionary approach recommended in the Canterbury Regional Policy Statement (CRPS). However, I note that there are several features of the CSNDC application that may lend support to a departure from this approach on the basis of unusual circumstances. CCC currently operates under Section 124 of the RMA for large parts of the city, which would support applying *Port Gore* and *New Zealand Energy*. However, the South West and Styx discharge permits are still active, which provides for a rather complex situation where part of the discharges would form part of the existing environment and other parts would not.

118. I also note that CLM has been carried out, and the actual contribution of stormwater discharges to surface water quality is understood to some degree. Further, the receiving waterbodies are, for the most part, heavily modified and have been for some years, while the stormwater discharge via the reticulated networks is a long existing activity. I also note the recognition in the LWRP water quality targets of the lower water quality in urban waterbodies.
119. In the first instance, following a precautionary approach, I consider that the 'environment' should generally be treated as excluding discharges from expired resource consents. However, in light of the features identified above, the Applicant may establish that the CSNDC application is an 'unusual' case that justifies the inclusion of discharges from expired consents. I am of the opinion that the above, in combination with the Applicant's 'real world' analysis of the receiving environment may be sufficient to consider the CSNDC application as an unusual case.
120. With regard to the consideration of the existing environment, I also note that the LWRP outcomes seek to achieve a certain 'state' of the receiving environments. Notwithstanding whether or not the existing stormwater discharge consents form part of the 'existing environment', it will be important to ensure that the proposal achieves, or shows commitment to work towards achieving, these outcomes.
121. Given the rather complex situation, the Hearing Panel will need to carefully consider the merits of the CSNDC, and whether the 'environment' should be treated as including or excluding the discharges from at least the expired discharge permit CRC090292. In my opinion, the Applicant may be able to establish that it is not feasible to consider the 'existing environment' without including the existing stormwater discharges, as well as residual adverse effects (e.g. fine sediment deposits and any ecological changes as a result thereof) from past lawful discharges.

ASSESSMENT OF ADEQUACY OF STORMWATER MANAGEMENT APPROACH

Overview

122. The CSNDC proposal is an example of adaptive management where mitigation options to address environmental effects can be modified based on monitoring and modelling data. An Adaptive Management Approach is typically used when there is a greater level of uncertainty about the impacts of a proposal, and therefore a greater reliance on monitoring, evaluation of data and feedback loops to address effects.
123. The New Zealand courts have considered the use of adaptive management in numerous resource consent decisions. The Board of Inquiry in the 'Sustain our Sounds' decision considered that before an adaptive management approach was authorised, it would need to be satisfied that¹⁵:
- (a) *There will be good baseline information about the receiving environment;*
 - (b) *The conditions provide for effective monitoring of the adverse effects using appropriate indicators;*
 - (c) *Thresholds are set to trigger remedial action before the effects become overly damaging; and*
 - (d) *Effects that might arise can be remedied before they become irreversible.*

¹⁵ Board of Inquiry, *New Zealand King Salmon Requests for Plan Changes and Applications for Resource Consents*, 22 February 2013, Paragraph 181.

124. The Courts have also been faced with the question of whether the precautionary approach requires an activity to be prohibited until further information is available, or whether an adaptive management approach is appropriate. The Supreme Court considered this issue in *Sustain our Sounds v New Zealand King Salmon Company Ltd*. The Court stated the answer depended on an assessment of a number of factors¹⁶:
- (a) *The extent of the environmental risk (including the gravity of the consequences if the risk is realised);*
 - (b) *The importance of the activity (which could in some circumstances be an activity it is hoped will protect the environment);*
 - (c) *The degree of uncertainty; and*
 - (d) *The extent to which an adaptive management approach will sufficiently diminish the risk and uncertainty.*
125. Based on the above, I consider the basic principles of adaptive management in the context of resource consents are:
- a. The collection of information to understand the issue/problem;
 - b. The development of objectives and performance criteria (e.g. through modelling) that set clear outcomes to be achieved;
 - c. The design and development of mitigation actions;
 - d. The implementation of mitigation actions;
 - e. Monitoring the implementation of actions;
 - f. An evaluation of the actions based on monitoring data collected;
 - g. The incorporation of the analysed data to inform further mitigation actions (feedback loop).
126. Whether an Adaptive Management Approach is appropriate for the CSNDC and whether the proposal meets the above basic principles is discussed in the following Sections.

Appropriateness of Approach for CSNDC

127. I consider that in the context of the CSNDC application, the principal issues associated with the stormwater discharges (Criteria (a) of the basic principles) are well understood.
128. In the context of the CSNDC application, the Applicant proposed a reduction of the contaminant load of stormwater discharges as specified in Table 2 of the proposed resource consent conditions, and the progressive improvement of the discharge quality to meet the Receiving Environment Targets specified in Schedules 4, 5, 6 and 7 of the proposed resource consent conditions to achieve Receiving Environment Objectives.
129. The Adaptive Management Approach proposed by CCC requires ongoing reporting, and additional investigations where modelling or monitoring does not show the required or anticipated results. Based on the investigations, the CSNDC requires definite actions to respond to any non-compliances with the proposed conditions.
130. The Applicant has also proposed conditions outlining that a SMP is required for each of the seven stormwater catchments, what the SMP must contain

¹⁶ *Sustain our Sounds Inc v The New Zealand King Salmon Company Ltd* [2014] NZSC 40, Paragraph 129.

(Proposed Condition 6) and what it must achieve (Proposed Condition 5). I note that only three catchment-specific SMPs have been finalised, and that four additional SMPs will be developed as detailed in Table 1 under Proposed Condition 4. The development of the SMPs will provide a greater understanding of the stormwater management challenges that are particular to each of the stormwater catchments. The SMPs may also include specific objectives for managing stormwater in each catchment and will outline the mitigation actions that are suitable to achieve the overall Receiving Environment Objectives and Targets.

131. While the planning of future works to improve discharge quality and quantity objectives and targets based on feedback from modelling and monitoring is an integral part of the Adaptive Management Approach, I consider that the planning of works authorised under the CSNDC (Proposed Condition 6(d)) should not be addressed within the SMPs as this is provided for in the Implementation Plan as proposed under Conditions 12 to 14. I note that the SMP should be used to identify the type or appropriate mitigation that is suitable in each specific catchment. I therefore recommend an amendment to this part of proposed Condition 6 to reflect this requirement, and I am of the opinion the proposed conditions 12 to 14 adequately address mitigation methods and devices to be used to address any adverse effects from the discharges.
132. In conclusion, I consider that given the nature of the proposal, an adaptive management framework would enable the Applicant to:
 - a. Obtain a discharge permit that meets Part 2 of the RMA without having a complete scientific understanding of the potential effects; and
 - b. Manage stormwater in a dynamic and integrated way, enabling responses to change over time as more information becomes available, models are updated and calibrated, and as technology evolves.
133. However, I also consider that an Adaptive Management Approach is required to be robust and achieves the outcomes sought. Therefore, the following uncertainties and information gaps in the proposal need to be adequately addressed before the approach can be considered acceptable:
 - a. Gaps and uncertainties about the appropriateness of proposed modelling approaches;
 - b. Uncertainties around the appropriateness of the proposed Receiving Environment Objectives and Targets;
 - c. Gaps in the information to be included in the SMPs;
 - d. Uncertainties relating to the implementation of proposed mitigation measures, and how information obtained from the EMP will be used; and
 - e. Gaps in and uncertainties around the proposed mitigation measures.
134. These matters are discussed further below and need to be evaluated by the Hearing Panel before a conclusion can be reached as to whether the Applicant's proposal meets the criteria identified by the Courts, and whether an adaptive management framework can be adopted.

Adequacy of Receiving Environment Objectives and Attribute Target Levels

Overview

135. A fundamental step in the adaptive management process described above is the formulation of the objectives and performance criteria or targets (refer to Criteria (b) of the basic principles described above).
136. The Applicant proposes objectives for freshwater, coastal water, groundwater and for flooding (see Schedules 4 to 7 of the proposed conditions; Schedule 3 provides objectives and targets for catchments for which no SMP has been prepared yet). For each objective there are one or several corresponding attribute targets. Proposed Conditions 19 to 22 outline how the schedules relate to the management of stormwater effects.
137. Overall, for water quality, the Applicant proposes progressive improvements towards meeting the Receiving Environment Objectives and Attribute Target Levels specified in Schedules 4 to 6 of the proposed conditions. This is proposed to be achieved by reducing contaminant loads in the receiving environments by installing stormwater mitigation facilities and devices for new developments, and by retrofitting water quality and quantity mitigation for existing development where practicable. Proposed Condition 16 sets contaminant load reduction targets for TSS, Copper and Zinc. CLM is proposed to be carried out in 5-yearly intervals over the duration of the resource consent to demonstrate compliance with the proposed reduction targets.
138. For the flood mitigation targets, the Applicant has proposed to use 'reasonable endeavours' to mitigate the effects of the stormwater discharges on water quantity. The extent of mitigation required is to be measured by the targets set in Schedule 7 of the proposed conditions.
139. The adequacy of individual Receiving Environment Objectives and Targets are addressed in the corresponding 'Effects' Sections below.

Discussion and Conclusion

140. Overall, I consider that the use of objectives and targets is appropriate for the CSNDC, as it will facilitate the measurement of performance and progress made. However, the objectives and targets need to be aligned with the outcomes, standards and limits of the relevant regional plans, and it will be important to ensure that the targets set are adequate and can be measured against these outcomes, standards and limits to demonstrate commitment to working towards improving the receiving environments.
141. Therefore, it will need to be determined whether the targets set in the CSNDC are appropriate to demonstrate the Applicant's commitment to progressively improve the quality of the discharge to meet the LWRP outcomes.
142. In the assessment of freshwater, coastal, groundwater and flooding objectives and targets in the sections below, I have considered the following:
 - a. If the objectives and targets are related to stormwater effects;
 - b. The effectiveness of how the targets will be measured and enforced;
 - c. The level of effects that would be acceptable for the proposal; and
 - d. How the objectives and targets relate to the regional plans.
143. Where the proposed objectives and/or targets do not sufficiently demonstrate commitment to progressively improve the discharge quality to meet water quality outcomes, standards and limits, recommendations have been made in

the relevant 'Effects' Sections to address the gaps identified. Further, where the technical experts have reached a different conclusion with regard to the proposed objectives and/or targets, more appropriate objectives and/or targets are proposed in the relevant sections.

144. In summary, I consider that the CSNDC proposal meets Criteria (b) of the basic principles of the Adaptive Management Approach, provided the recommendations outlined in the 'Effects' Sections below are adopted by the Applicant.

Adequacy of Mitigation

Overview

145. Following the development of objectives and performance criteria, another fundamental step of the Adaptive Management Approach is to design and develop the mitigation measures to achieve the set objectives and targets (refer to Criteria (c) of the basic principles described above).
146. The Applicant has described the measures that may be used to mitigate stormwater effects in Section 9 of the AEE. The Applicant generally details the types of tools and actions that may be taken; however, it is intended that each SMP will detail more specifically which mitigation measures are appropriate to address the unique stormwater management issues in each catchment. More detail on individual mitigation measures and their implementation are proposed to be provided in the Implementation Plan
147. Proposed Condition 6(d) states that a SMP is to provide "*mitigation methods to achieve compliance with the conditions of this consent including the requirement to improve discharge water quality*".
148. As described in Section 9 of the AEE, and as summarised in the 'Description of the Proposed Activity' Section above, specific measures are proposed for:
- a. Greenfields development;
 - b. Retrofitting in built-up areas;
 - c. Christchurch Hill areas;
 - d. Te Pātaka o Rākaihautū/Banks Peninsula settlements;
 - e. Construction-phase discharges;
 - f. Management of industrial sites;
 - g. Contaminated sites;
 - h. Management of flood risk; and
 - i. Non-infrastructure approaches to Stormwater Management.
149. The application and the SMPs do not explicitly state what measures will be implemented. To provide greater certainty to CRC and the public, the Applicant has proposed to develop, and update throughout the duration of the resource consent, an Implementation Plan. Proposed Condition 12 specifies that within 18 months of granting the CSNDC, an Implementation Plan will be provided to CRC and that the plan will be updated every three years concurrent with the CCCLTP.
150. The Implementation Plan is to include:
- a. A list of proposed stormwater mitigation methods and devices;

- b. A programme of stormwater works for CCC and private development;
- c. A plan for regulatory, investigative, educational and preventative activities or programmes relating to stormwater discharges;
- d. Details of budgets for capital works or resourcing that is linked to the CCC LTP; and
- e. Reporting on any testing or water quality monitoring undertaken that is used to check the performance of facilities or to inform prioritisation of areas for mitigation.

Submissions

- 151. The Avon-Heathcote Ihutai Trust expressed that the Applicant must commit to improve the surface water quality in all catchments. The conditions on this consent must be such that there is commitment by the City Council to provide the necessary implementation plans and funding to achieve these objectives. The Trust also questions the repeated use of the word “reasonable” or “practicable” in the proposed conditions and seeks clarification of the level of Council commitment to improve water quality.
- 152. The Avon-Ōtākaro Network considers that with the inclusion of a considerable number of individual consents into the comprehensive consent, there is need for the applicant to define what powers it would invoke to enforce compliance where necessary.

Consideration of Mitigation Measures

Proposed Mitigation Measures

- 153. I consider that the measures listed in the application cover the range of methods expected and currently used in Christchurch. Each of the methods has varying degrees of ease of implementation. The Applicant has briefly discussed this in Section 13 of the application. For the Styx and South West catchments, where large areas of greenfield developments have been proposed and are currently underway, the SMPs list the proposed stormwater treatment facilities required to service new and some existing urban developments. These facilities have been incorporated into the Outline Development Plans for new subdivisions prepared under the Christchurch City Plan and Christchurch District Plan provisions. These facilities are often constructed by the developer and then vested to, and managed by, the Applicant. If the developer does not construct facilities, there generally is a requirement for the payment of development contributions to CCC, which can then be used to fund stormwater facilities.
- 154. For greenfield developments, the requirement for treatment facilities can be managed by the Applicant through the plan change or subdivision process, and therefore I have confidence that the Applicant will ensure that stormwater effects from new development is appropriately managed to aid in the achievement of the Receiving Environment Objectives and Targets. Greenfield developments can also aid in retrofitting existing stormwater catchments by providing additional treatment capacities within the greenfield development site. This has already occurred for several existing catchments throughout Christchurch City. I note, however, that while Proposed Condition 25 requires retrofitting water quality and quantity mitigation for existing development where practicable, there is no explicit requirement for the retrofitting to be accommodated within greenfield site developments.

155. For brownfield developments, space constraints limit the type of treatment devices that are possible. However, the Applicant can manage the implementation of mitigation measures through building and/or resource consent processes. As for greenfield sites, developers will likely either need to fund and construct mitigation measures or pay development contributions to allow the Applicant to manage the stormwater effects.
156. For the existing urban areas where there is currently comparatively little stormwater treatment, the Applicant has described it will be almost impossible to establish large stormwater facilities unless a large quantity of land can be acquired. Land became available through the decision process for the future use of the Residential Red Zone (RRZ) along the Avon River Corridor, where larger facilities are understood to be constructed over the next few decades. However, for most of the existing urban area of Christchurch smaller devices will need to be considered to achieve stormwater treatment.
157. The Applicant has described the types of methods will likely include rain gardens, tree pits, swales and storm filters. These devices are most likely to be constructed on Council land such as in parks or within the road reserve. The implementation of these methods does not have the same certainty of implementation because of the process of funding and constructing them. Unlike greenfield or brownfield development, retrofitting stormwater treatment into existing urban areas will be funded from rates through the LTP and Annual Plan processes. Because of the location of devices, co-ordination across the Christchurch City Council will be required to ensure stormwater treatment can be incorporated into the other Council activities at the beginning of those projects.
158. The division of the rates funding across the Council means that the decision on budgets for stormwater treatment will be considered by CCC councillors in combination with all of the other CCC activities. The Applicant stated that due to this, it will be imperative that stormwater treatment is well integrated with other capital works and provides the best return for money. The Applicant acknowledges that while the programme for work will make some headway to improve stormwater treatment, until adequate funding is available, the Receiving Environment Objectives and Targets will not be met and improvements towards those outcomes will take time. The Applicant does consider that all opportunities to improve stormwater need to be explored within the budgets available and this includes non-structural approaches such as education and district plan provisions.
159. The challenge the Applicant faces in funding the retrofitting of stormwater devices cannot be disregarded. In a resource consent decision-making process, the level of uncertainty that the effects of the discharges will be avoided, remedied or mitigated presents some difficulty. As described above in the discussion on adaptive management, the Commissioners need to be satisfied that the approach to managing stormwater discharges taken by the Applicant is robust and achieves the outcomes sought. To ensure that implementation measures provide sufficient confidence that steps will be taken towards meeting the Receiving Environment Objectives and Targets, and that the discharges will not result in irreversible adverse effects, the uncertainties and information gaps in the proposal identified in this report need to be adequately addressed before the approach can be considered acceptable.
160. I am generally satisfied that stormwater mitigation measures will be implemented during land development or re-development across the district, although there are uncertainties around timing, funding and the degree of

development. I am, however, less confident that progress will be made towards achieving the Receiving Environment Targets in the existing urban areas due to the challenges faced in retrofitting treatment. New facilities in greenfield developments and brownfield re-developments will be very unlikely to remove all stormwater contaminants and the additional population growth may increase the overall contaminant loads in stormwater run-off. Therefore, I consider there is potential for further water quality degradation to occur.

161. Nonetheless, the C-CLM scenarios modelled suggest that there will be an overall reduction in contaminant loads in the four modelled catchments if best practice infrastructure is implemented over the duration of the resource consent. While there is uncertainty around the model inputs and as to what the future 'best practice' infrastructure development and retrofitting of existing catchments will look like, I note that CCC will be bound by conditions of consent to comply with the proposed contaminant load reduction targets (refer to Proposed Condition 49), if these targets are found to be adequate to demonstrate commitment to meeting the Receiving Environment Objectives and Targets. This is discussed in more detail in the 'Effect on Freshwater Quality and Aquatic Ecology' Section below.
162. With regard to Proposed Condition 6(d), I note that this should also refer to mitigation methods to achieve compliance with the requirement to improve discharge water quantity.
163. Further discussion is provided in the sections below as to whether the proposed mitigation measures are considered adequate to address the relevant potential adverse effects, and if the methods are adequate in order for the proposal to be not contrary to the objectives and policies of the relevant regional plans.
164. I also note that mitigation is only proposed to be undertaken if the proposed Receiving Environment Targets are not met. This means that no stormwater mitigation would be required if the impacts of stormwater network discharges have been overestimated. For receiving environments that are currently not adversely affected by the stormwater discharges, this could also lead to these environments being degraded up to a point at which the targets would no longer be met, and the receiving environment would be considered affected.

Proposed Actions

165. Proposed Conditions 35 to 38 detail how the Applicant proposes to investigate and implement methods to improve the management of stormwater quality and reduce stormwater effects on the receiving environment (stormwater quality investigation). These methods are presented in Tables 3 and 4 of the proposed conditions.
166. The purpose of the stormwater quality investigation are to monitor the performance of selected stormwater treatment facilities and devices, to assess the feasibility of new technologies and management strategies, and to investigate water quality improvement strategies and options.
167. While these investigations certainly have merits, it is unclear as to whether the outcomes of investigations or initiatives, if found to be successful, will be implemented in the long-term.

Adequacy of Level of Proposed Mitigation

168. The proposed conditions generally require CCC to use 'reasonable endeavours' to mitigate adverse effects from the stormwater network discharges.

169. The Oxford Dictionary defines 'reasonable' as "*as much as is appropriate or fair; moderate*" and endeavours as "*an attempt to achieve a goal*".
170. The term 'reasonable endeavours' has been used in the South West and Styx stormwater resource consents. However, there is little discussion in the evidence of the Applicant or from CRC about the term and its appropriateness and how it would be enforced. The application discusses the reasons for including the term 'reasonable endeavours', which includes taking into account the influence of elements outside of the control of the Applicant such as budget constraints, resourcing constraints, and the influences of the public, stakeholders and politicians on strategic decisions.
171. Given the uncertainty in relation to the decision-making process, I recommend that for surety regarding the commitment to achieve water quality outcomes, I recommend that the applicant should commit to taking all possible or reasonably practicable steps to obtain the resources, including land, required to retrofit stormwater treatment or to implement adequate 'at source' contamination prevention or mitigation methods. Although the water quality outcomes required by the LWRP and RCEP may not be met by the Applicant over the duration of the CSNDC (if granted), this will be necessary to demonstrate a commitment to progressively improve discharge quality and work towards meeting these outcomes.
172. I am of the opinion that the LTP funding and the uncertainty of whether future funding will be secured, will present a challenge for the Applicant and it is a reality that must be considered in the decision-making process. While I consider that the Applicant will need to take action and implement the methods that provide a high level of certainty that CCC is working towards achieving the outcomes, I also note that buy-in from the community will be required and that the methods chosen will need to be as cost-effective as possible.
173. As will be highlighted throughout the sections below, I consider that in general, conditions must be clear, enforceable and capable of objective ascertainment by a not necessarily expert person. This is necessary for assessing compliance with the conditions of consent, particularly in determining whether 'reasonable endeavours' have been taken to meet the proposed Receiving Environment Objectives and Targets if they are not met in the future. The need for clarity of the resource consent conditions to clearly demonstrate the Applicant's commitment to improving water quality has also been highlighted by a number of submitters.
174. As also highlighted in some of the technical reports attached to this report, I am of the opinion that the phrase 'reasonable endeavours' is not sufficiently clear and is likely to be difficult to be enforced, as it gives CCC considerable autonomy as to the threshold of effort imposed by the condition.
175. This was also highlighted during discussions with CRC Compliance staff, who noted that 'reasonable endeavours' is very subjective, and the phrase would need to be thoroughly defined to be able to enforce the conditions referring to it. Otherwise, it would be difficult to determine compliance with 'reasonable endeavours'.
176. It is my view that the resource consent conditions require clarity as to what the consent holder is required to do to meet the obligations imposed by the conditions, or, in this case, the Receiving Environment Objectives and Targets. In absence of clear and enforceable obligations under the proposed conditions, consideration will need to be given as to whether further conditions should

require all reasonable practicable measures to be taken to minimise any potential adverse effects from the proposed stormwater discharges.

177. The Applicant proposes to resolve through the WIM Group any conflicts with CRC regarding whether 'reasonable endeavours' have been used. While I acknowledge the Applicant's constraints with regard to timely implementation and funding of mitigation measures, certainty is needed for a resource consent to be granted based on an adaptive management approach. In light of the above recommendations, there will be a challenge for CRC in assessing whether all 'reasonable endeavours' have been used to achieve the Receiving Environment Targets. Therefore, clearer resource consent conditions should be imposed around what CCC is required to do to meet the obligations under the CSNDC.
178. To provide more certainty that mitigation will be implemented to progressively improve discharge quality and quantity, I consider that reference to 'all reasonably practicable measures' is more appropriate than 'reasonable endeavours'. This phrase would provide more certainty around suitable mitigation measures to be implemented, as well as more confidence working towards LWRP outcomes. It may also reduce potential for conflicts or disagreements that would need to be resolved via the WIM Group in accordance with the Protocol.
179. Overall, I consider that if there was sufficient certainty around what mitigation measures will be used over the duration of the resource consent (if granted), it may be appropriate to use the phrase 'reasonable endeavours' to achieve intended outcomes in conditions. However, the potential for funding and resourcing constraints throughout the duration of the CSNDC (if granted), as well as uncertainty around the desire from community and stakeholders around the cost involved in achieving the LWRP outcomes, means that there is a great deal of uncertainty around the implementation of future mitigation measures.
180. I also note that using 'all reasonably practicable measures' provides for more consistency with the requirements of the NPS-FM policy framework, which is discussed in more detail in the 'Objectives and Policies Section' below.
181. In addition to this, I note that Proposed Conditions 20 to 22 generally refer to 'mitigating' the effects of the discharge of stormwater on water quality and quantity. I note that 'minimising' might be a better phrase. This would mean that if adverse effects cannot be avoided, the Applicant should first be required to minimise any such effects (e.g. at the source through best practice on-site management) prior to correcting them through mitigation measures (e.g. large scale stormwater treatment facilities that treat entire sub-catchments).

Conclusion

182. Provided the above recommendations are adopted by the Applicant, I consider that adequate mitigation of the effects of the stormwater discharges will be provided for, and that the CSNDC proposal will be able to meet Criteria (c) of the basic principles of the Adaptive Management Approach outlined above.

Adequacy and Appropriateness of Use of Stormwater Management Plans

SMP Purpose and Content

183. The key mechanism to deliver stormwater treatment and guide stormwater mitigation proposed by the Applicant are the Stormwater Management Plans (SMPs) developed for each of the seven stormwater catchments. The SMPs describe how the catchments are managed to achieve the requirements of the

overarching resource consent conditions, including the Receiving Environment Objectives and Targets, to mitigate the effects of stormwater discharges.

184. For the CSNDC application, I consider that the SMPs are integral to the development and implementation of stormwater discharge mitigation measures, and therefore being a fundamental part of the Adaptive Management Approach that is required to meet Criteria (c) and (d) of the basic principles described above. As described above, the Applicant has completed SMPs for the Ōtākaro/Avon River, Huritini/Halswell River, Pūharakekenui/Styx River, and has proposed a timeframe for delivering four further SMPs for the remaining catchments until December 2020.
185. Proposed Condition 5 details the purpose of a SMP and Condition 6 prescribes what it must contain. The objectives of the SMP are described above and focus on demonstrating the means to progressively improving the water quality and quantity in the receiving surface water environments, improving/maintaining groundwater recharge and spring flows, and addressing groundwater mounding effects from future discharges into land.
186. These objectives of the SMP are in general accordance with the Water Quality and Quantity Standards conditions (proposed Conditions 19 to 25). While the objectives are very broad and compliance with the SMP conditions will be somewhat difficult to determine, I consider that overall it is useful to include these broad objectives as they demonstrate a general commitment to improving all catchments. However, I consider that the need to describe how compliance with the consent conditions is achieved and certainty around the adaptation to achieve the outcomes are much more crucial requirements of a SMP.
187. Both Dr Bolton-Ritchie and Ms Stevenson raised concerns around Proposed Condition 5(a), which requires the Applicant to demonstrate means to progressively improve discharge quality and quantity, applying only for the receiving environments where the Attribute Target Levels are not being met. However, for situations where the targets are met, or contaminant concentrations are well below the set targets, the purpose of the SMP should be to maintain the quality of the existing receiving environment and ensure that stormwater discharges do not result in degradation of the receiving environment into the future. I agree with these conclusions and have recommended an amendment to this condition.
188. The SMPs are proposed to include a description of the statutory and non-statutory mechanisms and mitigation methods to achieve compliance with the resource consent conditions, including the requirement to improve discharge quality. While the specific details of precisely what measures will be undertaken to mitigate stormwater effects may not be included in the SMP, as exemplified by the Avon SMP 'toolbox', this description is the key means of identifying the types of tools that are appropriate in a catchment.
189. Other requirements proposed by the Applicant for the SMPs include:
 - a. A description of the locations of current CCC mitigation facilities and devices;
 - b. Identification of areas earmarked for future development;
 - c. Identification of flood hazard areas;
 - d. An interpretation of monitoring and how this information is used to guide the development of mitigation practices;

- e. Results from water quantity and quality modelling;
 - f. A cultural impact assessment and summary of outcomes resulting from any collaboration with Papatipu Rūnanga on the SMP;
 - g. An assessment of the effectiveness of water quality and quantity methods established under previous SMPs and an identification of changes in method required if necessary; and
 - h. A summary of feedback obtained from Papatipu Rūnanga, the relevant Zone Committee(s) and the relevant Community Board(s).
190. The SMPs are to be submitted to CRC; however, no certification against the requirements under Proposed Condition 6 is proposed by the Applicant.
191. In addition to the information already required to be included in a SMP, CRC Senior Scientist (Surface Water and Ecology) Ms Michele Stevenson considers that the list should also include:
- a. Assessment of the impact of development and land use change planned for the catchment on catchment characteristics such as the impervious surface area percentage. This assessment could also include a characterisation of the stormwater pathways within different parts of the catchment (e.g. treated versus untreated, to ground or to surface water);
 - b. Identification of areas of high aquatic ecological or cultural value, including but not limited to springs and wetlands, and habitat for threatened species;
 - c. Assessment of water quality modelling results (where relevant) in terms of potential impact on the state of the receiving water quality and ecology, specific to the catchment and the proposed mitigation measures, with reference to Receiving Environment Objectives and Attribute Target Levels and LWRP outcomes;
 - d. A broad options assessment to clearly demonstrate the key drivers behind the mitigation measures selected for implementation;
 - e. A list of sites identified as 'high risk' within the catchment, including the likely contaminants and their risk to receiving environments. This could be based on the processes that CRC staff suggest are developed to mitigate the risks on large construction sites and contaminated sites that will be within the scope of the CSNDC after 2025 (see sub-sections below); and
 - f. Details of the process to be implemented to ensure that risks are sufficiently mitigated from 'high risk' sites within the catchment to prevent unacceptable adverse effects on receiving environments.
192. Dr Bolton-Ritchie provided some recommended changes to Proposed Condition 6, as well as a requirement for consideration of relevant non-statutory plans during the development of the SMPs (e.g. the Avon-Heathcote Estuary/Ihutai Estuary Management Plan and the Whakaraupō/Lyttelton Harbour Catchment Management Plan).
193. Further, Dr Bolton-Ritchie recommended that the SMP for the Estuary and Coastal Areas includes further details, including:
- a. Details on stormwater discharges to the estuary;
 - b. The current impacts of stormwater discharges on estuary water quality and ecology; and

c. A C-CLM or comparable model for the City Outfall Drain and Charlesworth Drain.

194. I agree with the inclusion of this additional information, as this would provide for the adequacy of mitigation measures required, as well as more clarity on the measures to be implemented through the Implementation Plan.
195. Overall, provided the above recommendations are included as conditions of consent (if the CSNDC is granted), I consider the requirements for the SMP will provide sufficient details to guide land developers, stakeholders and the public on what mitigation is appropriate and will be expected by CCC in each catchment. The SMPs will also demonstrate to CRC, stakeholders and the wider public where environmental improvements are sought and that stormwater effects are to be managed appropriately.
196. The procedures for amending or updating a SMP are included in proposed Conditions 8 to 11, which I generally consider adequate. However, as discussed in the 'SMP Review' Sub-section below, I note that the review frequency for SMPs should be amended to enable five-yearly reviews.

Public Input into SMP Development

197. Submitters have expressed concerns about the lack of information currently available about how stormwater will be managed. Several submitters have also commented on the uncertainty about the process of developing and updating SMPs, particularly outlining concerns about the lack of public scrutiny and ability for input into the mitigation measures to be adopted.
198. Due to four SMPs not having been developed to date, I recognise that there is some uncertainty around what measures will be undertaken in these catchments. Further, there is some uncertainty around how the three existing SMPs comply with the requirements under the recommended resource consent conditions (attached as Appendix One to this report). However, I consider that it is difficult for the Applicant to achieve a greater level of certainty because of the nature of how the mitigation is funded and delivered, which is discussed further below. Nonetheless, I consider that commitment to progressively work towards achieving improvements in discharge quality should be demonstrated.
199. The Applicant has included interim mitigation measures as Schedule 3 of the proposed conditions, attached to the proposed conditions, which outlines the stormwater treatment required until a SMP is in place. I consider that these measures provide sufficient certainty to address these concerns.
200. Regarding the ability for members of the public or stakeholders to influence the contents of an SMP, the Applicant states that the CCC will provide a draft copy of the SMPs to the chief stakeholders for feedback and that individual interested parties can comment on the SMPs through these groups. Proposed Condition 7 further requires that a SMP will be completed in consultation with Papatipu Rūnanga the Christchurch-West Melton and Banks Peninsula Zone Committees, and the relevant Community Board(s). A summary of feedback of this consultation is to be included in the SMPs prior to submitting or amending them in accordance with the Proposed Condition 6(n). Given the general public has the ability to participate in the public processes around Zone Committees and Community Boards and can directly contact Zone Committee and/or Community Board members regarding their concerns, I consider that in general this level of engagement is adequate. However, there are uncertainties around how recommendations from these groups will be responded to.

201. I also note the wish by some of the submitters to be consulted with throughout the development and review processes for SMPs and other resource consent related documents. These submitters include the Avon-Ōtākaro Network (requesting that water care groups are considered as key stakeholders), the Ōpāwaho Heathcote River Network, the Department of Conservation, the Ministry of Education (when Ministry land is affected) and New Zealand Steel Limited. In my opinion, these are reasonable requests and Proposed Condition (7) could be amended to include some of these groups, should the Hearing Panel agree.
202. Regarding the Te Pātaka o Rākaihautū/Banks Peninsula SMP, the Lyttelton Port Company (LPC) requested in its submission that the Whakaraupō/Lyttelton Harbour catchment should be separated from the wider Te Pātaka o Rākaihautū/Banks Peninsula SMP, and a new standalone SMP should be prepared for the Whakaraupō/Lyttelton Harbour settlements.

SMP Certification

203. The CSNDC requires each SMP to identify and address the specific receiving environment effects for each catchment.
204. As noted above, there is no certification process outlined for the SMPs when they are initially submitted, although certification of amended SMPs is required under Proposed Condition 11. This means that it will be difficult to ensure the SMPs align with the specific environmental issues that the individual catchments are facing.
205. Ms Stevenson considers that each new SMP will require the equivalent level of scrutiny as given prior to the CSNDC when an individual catchment resource consent was applied for. Dr Bolton-Ritchie also recommends a requirement for the SMPs to be audited and approved (i.e. certified) by a group of independent technical experts.
206. I agree with these recommendations and consider that a condition should be included requiring the submitted SMPs to be audited and certified by a Stormwater Technical Advisory Panel (Stormwater TAP). There is already a panel to identify, discuss and resolve stormwater management issues of strategic importance (i.e. the WIM Group). The SWAT Group is responsible for operational alignment such as ESC, industrial site audits, etc. The recommended Stormwater TAP could include a range of independent technical experts with expertise covering stormwater engineering, stormwater modelling, water quality, sediment quality, aquatic ecology, groundwater quality, erosion and sediment control, flood hazards and hydrological modelling, and contaminated site management. The role of the Stormwater TAP would be to undertake an independent certification of the final documents to ensure that best practice has been applied in all technical areas covered.
207. The panel could also facilitate the certification of amendments to SMPs, as provided for under Proposed Condition 11.

SMP Reviews

208. The Applicant has proposed that SMPs will be reviewed every ten years from the date of certification for the purpose of ensuring a holistic review is performed on every SMP at regular intervals to allow all changes made during that time to be collated and documented. The review is to assess the SMP against the requirements of proposed Condition 6. I consider that the review process is critical in the adaptive management process. Condition 6(m) also

specifies the need to assess the effectiveness of mitigation methods under previous SMPs.

209. I note that the three existing SMPs are currently proposed to be reviewed by 30 June 2024 (Styx), 30 June 2025 (Avon) and 30 June 2026 (Halswell). However, I am of the opinion that the review date for the existing SMPs will need to be amended and brought forward, as the proposed conditions require the inclusion of additional information that is currently not provided in these SMPs. While CCC considers the SMPs to be living documents that can be changed throughout their life, I consider that waiting until between 2024 and 2026 for the additional information to be documented and consulted on with Zone Committees, Community Boards and Papatipu Rūnanga does not meet the intentions on the consultative approach described in the resource consent conditions. This view is also supported by Ms Stevenson in her review of the Applicant's AEE.
210. I also note that the Huritini/Halswell River SMP is proposed to be reviewed by 30 June 2026, i.e. after the date by which the Applicant proposes to accept all discharges to the network as required by the proposed Condition 3. For the reasons outlined above, and to ensure the proposals consistency with Policy 4.16 of the LWRP, I consider the review of the Huritini/Halswell River SMP at the proposed date not adequate and I recommend that it is reviewed prior to 2025.
211. Further, a timelier review would be enable the inclusion of the work that has been carried out by CCC, CRC and Selwyn District Council in 2016 to better understand flooding in the lower Huritini/Halswell River catchment, as well as address the recommendation from the CRC River Engineering Section (addressed further in flooding effects section below).
212. Therefore, I recommend that the three existing SMPs be reviewed within two years following the commencement of the CSNDC (if granted), but no later than 20 December 2020 to bring the reviews in line with the general timeframe in which the SMPs are proposed to be developed.
213. In light of the above, I consider the proposed conditions for SMPs are somewhat unclear as to the lack of a certification requirement and the uncertainty around the review process and the result of the review. I have therefore recommended amendments to the Applicant's proposed conditions to provide further certainty of this process.
214. In addition, Ms Stevenson highlights that the SMPs are the key tool proposed to investigate catchment-specific issues and develop a programme of measures to mitigate effects of stormwater discharges. It is therefore considered important that the SMPs are informed by up-to-date and relevant sources of information, and frequent reviews will be required to incorporate the results of the programme of proposed stormwater quality investigations and the EMP, including any changes to regional and national planning instruments that may require amendments to the Receiving Environment Objectives and Targets. Ms Stevenson therefore recommends that the SMPs are reviewed every five years to ensure that effective and responsive feedback loops are in place.
215. I note that the Proposed Condition 9 allows for a timelier review of the SMPs; however, the need to review an SMP is solely based on whether this is considered necessary by the Applicant. As pointed out by Ms Stevenson, the SMP should be as up-to-date as possible with regard to changes in the regional and national planning frameworks. As detailed by Proposed Condition 9, new

opportunities for additional treatment, new technologies, etc. should also be considered as soon as this becomes available. On this basis, I agree with Ms Stevenson's recommendation.

216. On the basis of the above, I recommend that the SMP review conditions be amended to include:
- a. A review to occur every five years, except for the SMPs for the Ōtākaro/Avon River, Huritini/Halswell River, Pūharakekenui/Styx River, which are to be first reviewed within two years of the resource consent commencing but no later than 20 December 2020;
 - b. A review of all monitoring data and investigations completed within the catchment;
 - c. Based on monitoring data and investigations an update to known flood hazards, water quality and quantity modelling and the effectiveness of mitigation methods, including potential improvements required to the modelling and monitoring;
 - d. A revised summary of the location of water quality and quantity mitigation facilities;
 - e. A summary of collaboration actions with the Papatipu Rūnanga over the preceding five-year period; and
 - f. An evaluation of the success of mitigation methods required to achieve compliance with the resource consent conditions and any amendments to these methods to ensure compliance is achieved in the future. This is to be based on the monitoring results, investigations and revised water quality and quantity modelling.

Conclusion

217. Overall, I consider that the proposed development, implementation and review of SMPs is an effective method to demonstrate compliance with the conditions of consent, provided the resource consent conditions offer sufficient certainty around mitigation required until such time that SMPs are in place for all seven catchments.
218. Subject to the above recommendations being included in the resource consent (if granted), I consider the use of SMPs is an appropriate means to contribute to effectively managing the effects of the stormwater discharges. However, I note that SMPs are only a part of the wider 'toolbox' for managing effects of discharges. Nonetheless, provided the above recommendations are adopted by the Applicant, I consider that the CSNDC proposal will be able to meet Criteria (c) and (d) of the basic principles of the Adaptive Management Approach outlined above.

Adequacy of Proposed Monitoring, Reporting and Responses

Environmental Monitoring Programme

219. As outlined under Criteria (e) and (f) of the basic principles of the Adaptive Management Approach described above, the final key component in the adaptive management process is monitoring the implementation of mitigation methods, assessing monitoring results against the objectives and set performance measures (targets). Adaptation of mitigation approaches is necessary where the objectives or performance measures are not being

achieved satisfactorily, thus forming the last fundamental step of the Adaptive Management Approach (Criteria (g)).

220. This section addresses the proposed EMP, and how the Applicant proposes to report compliance against Receiving Environment Objectives and Targets, as well as the responses to monitoring.
221. The Applicant proposes conditions that require an EMP to be finalised and updated when required to assess compliance against the Receiving Environment Objectives and Targets. The draft EMP provided also includes some additional monitoring to provide information to assist operational decision-making such as prioritising areas for mitigation. In assessing the EMP, I have considered:
 - a. Whether the programme is adequate for assessing the potential effects of stormwater discharges;
 - b. Whether the results obtained will be sufficient for determining whether the Receiving Environment Objectives and Targets in Schedules 3 to 7 are being achieved; and
 - c. Whether the Applicant is complying with proposed Conditions 16 to 18 (Stormwater CLM), 19 to 22 (Water Quality and Quantity Standards) and 35 to 38 (Other Actions by the Consent Holder).
222. The draft EMP proposes monitoring of:
 - a. Soil quality beneath infiltration facilities;
 - b. Groundwater quantity and quality;
 - c. Surface water levels and flows, sea level and rainfall depth;
 - d. Surface water quality;
 - e. Instream sediment quality;
 - f. Aquatic ecology; and
 - g. Mana whenua values.
223. Generally, all monitoring is being undertaken in the receiving environment rather than at the end of a stormwater pipe or adjacent to an infiltration device. It is understood that this is due the number of stormwater outlets making it difficult to monitor the discharge quality.
224. However as noted above, the links between receiving environment quality and stormwater discharge quality, i.e. the impacts of stormwater discharges on the receiving environments (e.g. within the coastal environment), are not fully understood. Nonetheless, the proposed receiving environment monitoring allows for an ongoing assessment of the state of the groundwater, freshwater, coastal water and soil resources, and can provide long-term trends of declining, maintaining or improving the receiving environments.
225. It should be noted, however, that as opposed to end-of-pipe monitoring where detection of exceedances of specified contaminant concentration thresholds is relatively straightforward, the trends that are monitored in the receiving environments are difficult to reverse, and the detection of causes and implementation of mitigation often occurs delayed and not overly targeted at the contamination sources.
226. I further note that other activities contribute to the general quality of the receiving environment, and it can be difficult to attribute specific effects to the stormwater network discharges. Such other activities include, but are not

limited to, dewatering water discharges, uncontrolled hill stormwater runoff, wastewater overflows, in-stream construction works such as dredging or bank protection works, or algae clearance works and dumping of rubbish, as well as other contaminant discharges to stormwater network (e.g. spills, car washing, misconnections from greywater).

- 227. Overall, the proposed EMP is generally supported by the technical experts; however, some changes are recommended to the methodology and parameters that are being monitored in the receiving environments. These changes are discussed in more detail in the relevant 'Effects' Sections below.
- 228. In summary, I consider the EMP to be the final key component in the adaptive management process, which provides information on the efficacy of implemented mitigation methods and assessing monitoring results against the set objectives and performance measures. However, the nature of receiving environment monitoring and challenges in being able to assess stormwater impacts in these environments need to be acknowledged.

Annual Report

- 229. The Applicant proposes to provide a summary of the monitoring results to CRC in an annual report. Proposed Condition 53 specifies what the annual report shall include.
- 230. While I agree with the annual reporting approach, I note that a key matter will be the interpretation of the monitoring data and the use of this data to assess compliance with the resource consent conditions and trigger the responses required. Therefore, it will be critical that the results are provided to CRC in a format where CRC staff can audit the results and ensure outcomes are being achieved. This requirement is currently not incorporated into the conditions, and corresponding changes to the reporting conditions are proposed.
- 231. As discussed above, the Technical Advisory Panel could assist in interpreting the monitoring data presented in the Annual Reports and identifying appropriate responses.

Responses to Monitoring

- 232. As discussed above, a critical component of the adaptive management process is the utilisation of monitoring results to inform further mitigation methods to address the effects of the proposed activity (feedback loop).
- 233. In Proposed Condition 49 and 50, the Applicant outlines the responses to modelling, and Proposed Condition 51 addresses responses to monitoring of the Receiving Environment Attribute Target Levels.
- 234. In general, if modelling or monitoring results identifies any discrepancies with the proposed contaminant load reductions and targets, respectively, the Applicant proposes to investigate the issues, evaluate the results and address them and include this information in the annual report. If no agreement can be reached between CCC and CRC regarding any aspects of the response to monitoring, the Applicant proposes to consult the WIM Group in accordance with the Joint Stormwater Management Protocol to find a solution, which will then be implemented.
- 235. I consider that resource consent conditions must safeguard against failure to detect and remedy significant adverse effects that are identified during the modelling and monitoring. If conditions are not clear, there is a potential for disagreement over the interpretation of annual monitoring results and whether

further investigation is required. However, as noted above, the formation of a Technical Advisory Panel could be helpful in avoiding such disagreement.

236. Overall, I consider that the responses to the modelling and monitoring results are critical. However, the proposed conditions around the responses are vague as there is no clarity as to what the subsequent investigations and actions are required to include and what level of detail is required. This leaves room for uncertainty as to what the Applicant's response will look like and whether adequate corrections/remedial actions will be implemented prior to elevating any issues to the WIM Group.
237. Recommended changes to the responses to the modelling and monitoring results to increase certainty are discussed further in the technical reports and the 'Effects' Sections below.
238. The responses to the C-CLM will also need to be considered in light of the uncertainty as to how conflict will be resolved through the WIM Group if:
 - a. Modelling targets are not achieved, but monitoring data suggests that there is no measurable decline in the quality of the receiving environment; or
 - b. If the modelling targets are achieved, but monitoring data suggests that there is a decline in the quality of the receiving environment.
239. Further, the investigations are only triggered if compliance with the contaminant load reductions and/or targets in Schedules 4 to 6 of the proposed conditions are not achieved. Therefore, I question whether it would be useful if 'early warning' triggers would be appropriate to prevent a failure to meet the proposed contaminant load reductions and targets.
240. On this basis, I consider that it would be appropriate if the conditions addressing the responses to the modelling and monitoring results are amended to provide more certainty and to provide 'early warning' mechanisms of not meeting targets set in the resource consent conditions, so that the targets are not exceeded in the first place, and further increases in adverse effects are avoided. Recommended changes are provided in the relevant 'Effects' Sections below.
241. With regard to Proposed Condition 51, Dr Bolton-Ritchie commented that either timeframes for each report must be stipulated in conditions, or it must be assumed the reports must be completed by 30 June each year (as stipulated on page 58 of the EMP and in Proposed Condition 53). This should be clarified by the Applicant.

Conclusion

242. Based on the information above, and subject to the recommendations discussed in the 'Effects' Sections below, I consider that for the CSNDC an Adaptive Management Approach to the management of stormwater discharges is appropriate, as the proposal meets the basic principles discussed above as follows:
 - a. The Applicant has collected information on surface water and groundwater quality and quantity and modelled the effects of the stormwater discharges on the receiving environments. On this basis, the effects of the proposal are well understood.
 - b. The Applicant has developed appropriate Receiving Environment Objectives and Targets that set outcomes that are to be achieved under

the CSNDC. These objectives and targets are consistent with LWRP water quality and quantity outcomes.

- c. The recommended changes outlined above will address the design and development of mitigation actions on an SMP level.
- d. The implementation of mitigation actions, subject to the changes recommended below, will be ensured through the resource consent conditions, the SMPs and the Implementation Plan.
- e. The Applicant has proposed to monitor the implementation of mitigation actions. Adherence to approved guidelines and standards, as required under the proposed conditions, is recommended.
- f. The Applicant has prepared a comprehensive EMP to monitor the effectiveness of mitigation measures. Reporting and responses to monitoring are proposed, where mitigation measures are to be evaluated and amended as required to meet the set targets. Minor changes have been recommended to the EMP, which will ensure consistency with the principles of the Adaptive Management Approach.
- g. The data collected and analysed as part of the EMP is proposed to be used to inform further mitigation actions.

ASSESSMENT OF ACTUAL AND POTENTIAL EFFECTS

Overview

- 243. The Applicant has provided an assessment of the nature of potential effects that may occur as a result of the proposed stormwater discharges in Section 8 of the application (Pages 119-135). An amendment to that assessment with regard to the proposed CLM approach and acceptance of all discharges from 1 January 2025 onwards was provided on 9 July 2018.
- 244. In auditing this application, I have relied on expertise within the CRC, my experience in auditing resource consents for stormwater and other contaminant discharge activities and direction from the Objectives and Policies in the Canterbury Regional Policy Statement (CRPS), LWRP and RCEP. I have also relied on advice from the other Section 42A officers, CRC Principal Consents Advisors Paul Hopwood and Yvette Rodrigo, CRC Scientists and CRC Compliance staff, as well as legal advice from Wynn Williams.
- 245. My audit focuses on the goals (objectives) and targets sought to be achieved, the process in which these goals and targets are sought to be accomplished, and how the Applicant will measure, evaluate, respond to and adapt the proposal to ensure progress towards the goals is realised. The intended outcome of this audit is a conclusion as to whether or not the proposed framework, with all of its uncertainties, is sufficient to meet relevant statutory tests.
- 246. My audit of the Applicant's assessment is structured as follows:
 - a. Effects during construction and development;
 - b. Effects of discharges from HAIL and industrial sites;
 - c. Effects on soil quality;
 - d. Effects on groundwater quality;
 - e. Effects on groundwater quantity;

- f. Effects on surface water quantity;
- g. Effects on freshwater quality and aquatic ecology;
- h. Effects on coastal water quality and aquatic ecology;
- i. Effects on aquatic ecology;
- j. Effects on amenity and recreational values;
- k. Effects on cultural values; and
- l. Effects on property, persons and organisations.

Effects During Construction and Development

Overview

- 247. Until 31 December 2024, the Applicant proposes to exclude any development areas listed on the LLUR that are considered by CCC to pose an unacceptably high risk of surface water or groundwater contamination. Further, any stage of development with a total area of disturbance exceeding 5 ha on flat land or 1 ha on hill land are proposed to be excluded, as are the sites listed on Schedule 1 of the proposed conditions. Construction-phase discharges from all other sites are proposed to be included under the CSNDC pre-2025.
- 248. From 2025 onwards, the Applicant seeks to include all construction-phase stormwater discharges to the reticulated network and waterways within the scope of the CSNDC. Construction-phase discharges from all non-HAIL and low-risk HAIL sites onto and into land within the individual sites are also included. Construction-phase discharges onto and into land from high-risk HAIL and industrial sites will be excluded.
- 249. The discharge of construction-phase stormwater may contain significant concentrations of sediment and may contain other contaminants from historical land uses or during the construction process (e.g. hydrocarbons, metals, CCA, etc.).
- 250. In general, the discharge of sediment to both surface water bodies and coastal waters is a significant concern as sediment can affect water quality and aquatic ecology, e.g. by smothering habitat of aquatic species. Large quantities of sediment are also flushed into the Ihutai/Avon-Heathcote estuary.

Submissions

- 251. The Ōpāwaho Heathcote River Network and the Cashmere Stream Group raised concerns about sedimentation of water bodies within the Ōpāwaho/Heathcote River catchment. In general, modelling and ongoing monitoring of sediment entering surface water is supported.
- 252. The Lyttelton Port Company (LPC) sought more clarity on what constitutes site development and site redevelopment.
- 253. Other submitters raised general concerns around water quality, which can be partially accounted to the sediment discharges.

Receiving Environment Objectives and Targets

- 254. A more detailed review of the relevant Receiving Environment Objectives and Targets is provided in the sections below. However, with regard to sediment loss from construction sites, especially to surface water, Schedule 4 of the proposed conditions includes the objective to “*Decrease sediment input to*

prevent adverse effects on water clarity and aquatic biota". The target is the percentage cover (<2 mm diameter) of the stream bed. The target value percentage cover is between 20 and 30% dependent on the type of waterway¹⁷. Upper limits for concentration of TSS in surface water are also included as a target, with a TSS limit of 25 mg/L during base flow and 100 mg/L during wet weather. Schedule 4 also includes the objective: "*Improve instream sediment quality to prevent adverse effects on aquatic biota*"; however, this objective and the associated targets are aimed at improving Zinc, Copper and Lead concentrations in instream sediment. No target is provided specifying a maximum TSS limit for stormwater discharges.

255. Schedule 5 of the proposed conditions also includes the objective to decrease sediment inputs into coastal waters. The proposed target measure is TSS, but no target values have been set yet as there is insufficient information about TSS levels in the coastal environment.
256. I generally agree with these objectives and targets. However, with respect to reducing sediment input to waterways, I note that no TSS limits for stormwater discharges have been set. A TSS limit would be a helpful means to measure compliance of discharges from individual sites. This is discussed further in the following sub-sections.

Proposed Mitigation Measures

257. To ensure appropriate mitigation is undertaken to address the discharge of sediment, the Applicant proposes Receiving Environment Objectives and Targets specifically for sediment. Proposed Condition 20 requires the Applicant to mitigate effects of the discharge of stormwater on surface water quality, instream sediment quality, aquatic ecology health and mana whenua values, all of which are closely linked to the sediment discharges.
258. The Applicant has also proposed some specific mitigation measures for erosion and sediment control (ESC) under Proposed Conditions 39 and 40. These include:
 - a. All developments will require Erosion and Sediment Control Plans (ESCP);
 - b. All ESCP are to be in accordance with the CRC Erosion and Sediment Control Guideline (ESCG) or any successor document (i.e. the Erosion and Sediment Control Toolbox for Canterbury); and
259. In Table 3 of the proposed conditions the Applicant further proposes to:
 - a. Conduct a study to investigate the feasibility and techniques for addressing adverse effects of stormwater sediment discharges on receiving environments. This will include consideration of sediment cover of the bed, and copper, lead, zinc and PAHs contamination.
 - b. Initiate a remediation programme if the consent holder considers that the stormwater sediment discharge investigation in item 7 of Table 3 indicates sufficient merit.
260. As discussed in more detail in the 'Effects on Freshwater Quality and Aquatic Ecology' Section below, Ms Stevenson and Dr Bolton-Ritchie generally conclude that insufficient information has been provided on how construction-phase stormwater discharges will be managed post-2025, specifically discharges from high-risk sites during site development.

¹⁷ The target value percentage range relates to LWRP waterway classifications.

261. I consider that while all development sites are required to prepare an ESCP, there is no clear process identified by the Applicant as to how construction sites are to be managed. The proposed Receiving Environment Objectives and Targets seek a TSS load reduction, as do the proposed conditions around CLM. I note that an adaptive management regime is required to be sufficiently certain and robust and should be directed towards achieving appropriate environmental outcomes; in this case a reduction in TSS in stormwater discharges to ensure adverse effects on water quality and aquatic ecology are acceptable. Given this, I consider that the ESC approach is one of the key components of the CSNDC; however, only limited information has been provided as to how this will be managed under the CSNDC. I note, however, that the Applicant has until 2025 to develop a strategy for managing these sites, which is likely to require additional staffing and approval through the LTP process.
262. As noted, the proposed target measure in Schedules 4 and 5 of the proposed conditions is TSS, but no TSS limits for stormwater discharges have been set. However, CRC Compliance staff support including a TSS limit that both CCC and CRC can enforce to ensure individual sites are managing construction-phase discharges effectively. Therefore, consideration needs to be given as to whether the inclusion of a TSS limit for discharges from individual development sites would be required, either as part of the Receiving Environment Objectives and Targets or separate resource consent conditions. This would ensure that it can be easily and readily determined whether compliance with the resource consent conditions is evident. This consideration also needs to include whether downstream treatment facilities are provided to ensure any construction-phase stormwater discharge to the network meets the required standards after mixing in the receiving environment.
263. CRC Compliance staff have recommended specific TSS limits for development sites and lower limits for discharges from sites where contaminants could be entrained in sediment. This will need to be based on LWRP guidance; however, there should also be scope for individual sites struggling to meet set limits to have a higher TSS limit. Such higher limits would need to be agreed on by CRC in writing and should be only granted for sites where all practicable steps have been taken to minimise sediment in the discharge, but the discharge is still unable to comply with the specified TSS limit. Without a TSS limit for development sites as part of the conditions of the CSNDC (if granted), CRC Compliance staff raised concerns that it may be difficult for CCC to meet the discharge objectives and targets in Schedule 4 of the proposed conditions. Set limits are also considered to give contractors or developers a target that is needed to be met. Without such a target, insufficient ESC may be implemented by the contractor or developer, while claiming that reasonable endeavours have been used. The inclusion of a TSS limit would also allow CCC to request assistance from CRC where site developers are being negligent, or when limits are not being met by an individual. On this basis, if the specified limits are not met, CRC could take enforcement action against the developer directly.
264. Further, CRC Principal Science Advisor (Contaminated Sites) Mr Rowan Freeman noted in his review of the Applicant's AEE that if LLUR site categories are proposed to be used to determine the level of risk posed by a site, further clarification is required on how the applicant will work through more complex scenarios (refer to Appendix 2 of this report). Mr Freeman also questions how construction sites will be managed where contaminants in the dissolved phase can migrate off-site with stormwater discharges during construction, rendering conventional erosion and sediment control measures ineffective.

265. With regard to the relevant 'Other Actions' described in Table 3 of the proposed conditions, specifically Item 8, which requires initiating a remediation programme, I note that there are no clear criteria set as to how the merit of the feasibility investigation under Item 7 will be determined. However, I note that this is a decision that could be made by the recommended Stormwater TAP.

Recommendations

266. As discussed, with regard to ESC, I do not consider that a sufficiently clear and robust process has been provided to ensure that the proposed conditions adequately address the potential adverse effects of the sediment discharges. Further, while all high-risk development sites are excluded from the CSNDC pre-2025, greater detail is required about the Applicant's capacity and approach to managing and monitoring high-risk sites during construction post-2025.
267. On this basis, I recommend that an approach be developed by the Applicant as to how discharges from construction sites are to be managed under the CSNDC. This is to be finalised prior to 2025. In general, I consider it beneficial if this approach was developed in collaboration between the two councils, with input from both CCC and CRC experts.
268. The approach could include the following components:
- a. Risk Matrix:
 - i. Develop a risk matrix to triage construction-phase discharges to facilitate the development of different assessment/monitoring pathways based on set criteria.
 - ii. Criteria could include scale/area of disturbance, slope of land (i.e. flat land vs port hills), soil type, sensitivity of receiving environment (i.e. proximity to waterways), HAIL vs Non-HAIL site (including contaminants present in suspended or dissolved form), etc.
 - b. Erosion and Sediment Control Plans/Site Management Plans:
 - i. ESCPs should be required for every construction-phase discharge from development sites. The level of information required, and assessment of these plans, would be determined by the risk matrix.
 - ii. Single sites on flat land that are not HAIL sites or adjacent to waterways could simply be assessed by resource consent officers or building consent officers.
 - iii. Higher risk sites should be subject to a more thorough review. For HAIL sites this would need to include a review by a suitably qualified and experienced person (SQEP).
 - iv. ESCPs for HAIL sites will need to be expanded to provide details of site contamination levels, contaminated soil management, accidental discovery protocols and any necessary site validation testing. Information regarding soil testing and remediation also needs to be provided to CRC.
 - c. CCC Authorisations:
 - i. CCC provides authorisation (written permissions) to contractors/site owners for construction-phase discharges to be accepted under the CSNDC. This authorisation could be subject

to conditions, which may include a discharge limit (if included on CSNDC) and requirement to install, maintain and monitor ESC measures. The scale of the authorisation would need to align with the level of risk.

- ii. Copies of the ESCPs and the CCC authorisation should be provided to CRC. It needs to be taken into consideration whether this should be only for high-risk sites or all sites that require ESCPs.

d. Monitoring:

- i. Monitoring of ESC measures implemented on-site is necessary. For lowest risk sites this may just be a check prior to excavation works commencing on site. For higher risk sites, more frequent checks would be necessary by skilled staff.

e. Staff Responsibilities, Training/Resourcing:

- i. Details of key CCC staff responsibilities needs to be provided to CRC. Those staff responsible for different steps in the assessment/monitoring process should be described.
- ii. The necessary training and on-going resourcing for CCC staff should be described.

f. Independent Review:

- i. An independent auditing process of the receipt, assessment, authorisation and monitoring of discharges should be included. This would be undertaken by a suitably qualified person who would review what information was provided to CCC, how it was assessed, whether the authorisation provided aligned with the level of risk and if the erosion and sediment control mitigation was effectively implemented.
- ii. This audit process should be undertaken once per year for a selected number of authorisations and a summary report should be provided to CRC.

- 269. CRC Compliance staff commented on the proposed conditions around ESC, stating that this should also include a strategy to deal with construction sites within the Central City, which often have a small footprint but a large impact if not managed adequately.
- 270. It was highlighted by CRC Compliance staff that a clear process and delegation of powers is needed to enable the implementation of enforcement actions if these are necessary for individual site owners.
- 271. Therefore, with regard to how any non-compliances from individual sites are enforced, a process needs to be developed between CCC and CRC to determine delegation of enforcement powers and how enforcement actions can be implemented. This may be via a revision of the Joint Stormwater Management Protocol, e.g. to the existing provisions in Protocol for how compliance issues are managed, or other agreements between the two councils.
- 272. I also recommend the inclusion of a TSS limit for construction-phase stormwater discharges from individual development sites. As noted above, the inclusion of a TSS limit on the resource consent would enable CRC Compliance staff to clearly manage compliance assessment of resource consent conditions. Such an approach should also consider whether or not any

treatment within the reticulated network is provided prior to the discharge to receiving water bodies.

Conclusion

273. As identified above, there are some uncertainties regarding how the Applicant is going to manage, in particular, the risk from larger construction sites post 2025. If these sites are not managed appropriately, the extent of effects on the receiving environment may be greater than anticipated.
274. For the reasons outlined above, I have recommended:
- a. An approach that could be used to manage these sites; and
 - b. The inclusion of TSS limits to provide a mechanism for CCC and the CRC to enforce the requirements of the CSNDC.
275. Overall, provided the above recommendations are included on the CSNDC (if granted), I consider that the approach to ESC would provide for adequate management of construction-phase stormwater discharges under the CSNDC (if granted) to mitigate adverse effects of sediment discharges to receiving environments.

Effects of Operational Discharges from HAIL and Industrial Sites

Overview

276. Until 31 December 2024, the Applicant proposes to exclude any operational-phase stormwater discharges from sites listed on the LLUR that are considered by CCC to pose an unacceptably high risk of surface water or groundwater contamination. Further, sites listed on Schedule 1 of the proposed conditions are proposed to be excluded.
277. Excluded discharges to the CCC's network, however, are proposed to fall within the scope of the CSNDC from 1 January 2025 onwards (if granted), unless an existing site-specific discharge permit expires past this date, whichever is the latest. Stormwater discharges into land within individual sites from existing industrial and commercial hardstand will continue to be excluded from the CSNDC post-2025.
278. This section assesses the potential adverse effects on the receiving environment from operational stormwater discharges from these sites once CCC have accepted these under the CSNDC, and the mitigation proposed to address the risks associated with existing and future HAIL sites.
279. Until 2025, operational stormwater discharges from high-risk HAIL and industrial sites will be addressed via individual resource consents and the current processes in place between the two councils, which are described below.
280. The potential effects of accumulation of contaminants in infiltration devices are assessed in the 'Effects on Soil Quality' Section below. The effects arising from construction-phase stormwater discharges from HAIL sites are addressed in the above section.
281. The nature of contaminants from these sites could be varied as HAIL sites range from chemical manufacturing, storage and application, electricity generation and transmission, to vehicle refuelling, service and repair and waste processing. The contaminant concentrations and the significance of the contribution of contaminants from HAIL sites to the overall stormwater contaminant load is unknown. Contaminants from these sites, however, could

be at concentrations greater than other land uses and pose risks to ecological and human health. The Applicant states that a significant portion of high risk HAIL sites are listed on the CRC LLUR and in the Avon catchment 25.7% of the catchment area is included on the LLUR and potentially contaminated.

Receiving Environment Objectives and Targets

282. To address the potential effects of discharges from HAIL sites the Applicant has proposed Receiving Environment Objectives and Targets for:
- a. Dissolved metals in water;
 - b. Metals in sediment; and
 - c. 50% of the Maximum Acceptable Value of metals in groundwater and to ensure no increase in trends.
283. Mr Freeman generally agrees with the proposed Receiving Environment Objectives and Targets but notes that not all contaminants of concern that have the potential to adversely affect surface water quality appear to be included. Mr Freeman recommends that a statement about the suitability of copper, lead and zinc to act as surrogates for the wider suite of potential contaminants that have not been included would be beneficial. Alternatively, I consider that the resource consent conditions could be amended to provide a means of understanding, monitoring and reporting on contaminants from HAIL sites where there are no Receiving Environment Objectives and Targets set for these contaminants.
284. Mr Freeman also questions the completeness of the attributes identified to protect drinking water quality as these do not represent the full suite of contaminants that could adversely affect human health. This is further addressed in the 'Effects on Groundwater Quality' Section below.
285. With respect to reducing sediment input to waterways, Mr Freeman considers that more emphasis should be placed on the potential for contaminants such as copper, lead, zinc and PAHs to be adsorbed to and transported with sediment from contaminated sites to surface waterways.

Submissions

286. Z Energy Ltd, BP Oil Ltd and Mobil Oil NZ Ltd (Oil Companies) raised concerns about the general lack of clarity, guidance, certainty, transparency and connectivity relating to the management context of inputs and effects of discharges from third party properties as a result of this application. The issues raised include the exclusion of construction and operational stage discharges from Oil Company sites within Christchurch City. The Oil Companies also consider that the proposed resource consent conditions will not enable a clear and obvious pathway for stormwater discharges from excluded sites.
287. LPC requested that a new a new schedule is submitted by the Applicant to provide clarity on when stormwater discharges are acceptable from industrial sites.
288. Ravensdown Ltd generally supports the CSNDC application; however, concerns are raised about the provision of a clearer direction for water quality and quantity targets in the resource consent conditions and associated lines of accountability for industrial sites in meeting those targets. In general, it was noted that there is uncertainty around expectations for industrial sites.
289. The Avon-Ōtākaro Network stated in its submission that more reassurance regarding the proposed compliance enforcement mechanisms are required

from the Applicant given the inclusion of a considerable number of individual resource consents into the CSNDC.

Existing Practices for Acceptance of Discharges from HAIL Sites to the Network

290. The current process of accepting HAIL sites under the existing 'global' resource consents is outlined in the Memorandum of Understanding (MOU) between CCC and CRC, which is to be followed in determining whether a site poses a high or low risk. The MOU has been developed initially to address resource consent requirements and exclusions from the current 'global' stormwater discharge permits held by the Applicant for residential HAIL sites that are being developed or re-developed. However, the MOU has also been used successfully to determine the risk associated with other HAIL, including commercial and industrial sites.
291. The MOU protocol outlines that before accepting sites on the LLUR under the stormwater consents (currently granted) the Applicant is to assess the sites against specified assessment criteria. If the site meets the low risk criteria it can be accepted. If the site is deemed to have moderate or high risk, the site is then referred to CRC for assessment. If CRC consider the site is low risk it is accepted by the Applicant, if CRC consider the site is moderate or high risk, the site owner must apply for a separate resource consent and it is excluded from the 'global' resource consents. Assessment criteria have been developed for residential sites and for commercial/industrial sites.
292. While the MOU is generally aimed at development on existing HAIL sites, Mr Freeman commented that the process provides a good framework for decision-making to manage the risk posed by stormwater discharges from all HAIL sites.

Industrial Site Audits

293. The Applicant proposes to carry out audits of stormwater management practices on existing industrial sites, with ten sites proposed to be audited per year. The aim of these audits is to achieve a stormwater discharge quality from industrial sites that is the equivalent quality to the discharge quality from residential areas. The Applicant considers that to achieve this, almost always some form of pre-treatment will be required.
294. The industrial site audit process is intended to identify sites that have the potential to discharge contaminants at concentrations significantly higher than residential and commercial sites. The process will identify such sites via a desktop assessment. On-site audits will then be undertaken where the Applicant can confirm if a site is high risk and what site owners can do to meet the required standards for discharges into the reticulated network.
295. Sites that pose an unacceptably high risk can be added to Schedule 1 of the proposed conditions until 31 December 2024; however, no new sites can be added after 1 January 2025.¹⁸
296. The industrial site audit process was also a requirement under the 'Styx' and 'South West' stormwater discharge permits; however, this process has only commenced recently, which is understood to be due to a lack of funding. Nonetheless, the audit process is proposed to commence under the CSNDC,

¹⁸ At this stage it is uncertain as to what duration any individual resource consent would be granted for up to this date. This will need to be considered by CRC subsequent to the granting of the CSNDC (if granted).

and information with regard to this has been provided with the RFI response to the initial application CRC160056.

297. I consider that the proposal to carry out ten audits per year appears to be very limited given the scale of the city. Currently, the Applicant is required to carry out a minimum of 30 audits per year under the existing 'global' resource consents CRC090292 (ten audits per year), CRC131249 (ten audits per year) CRC120223¹⁹, which CCC is on track to complete this year. I therefore recommend that at least 30 audits are carried out per year, which is discussed further in the 'Recommendations' Sub-section below.

Approach to Non-HAIL, Low-risk HAIL and Industrial Sites under the CSNDC

298. All operational phase discharges from non-HAIL and low-risk HAIL sites will be included under the CSNDC (pre and post-2025), except where existing commercial and/or industrial hardstand discharges onto or into land within individual sites.
299. Mr Freeman did not raise any concerns about the proposed exclusion of all operational phase discharges from existing hardstand on commercial and industrial sites to land within sites.
300. Based on Mr Freeman's advice, I consider that the approach to low-risk and non-HAIL is adequate, provided that on-site stormwater management is adequate to ensure that discharges from these sites pose no greater threat to the receiving environment than that posed from residential areas.

Approach to High-risk HAIL and Industrial Sites under the CSNDC

301. Mr Freeman reviewed the information provided by the Applicant on how HAIL and industrial sites are proposed to be managed by CCC post-2025.
302. Mr Freeman provided a list of HAIL activities that generally pose a high risk to stormwater discharges. However, he also notes that the level of risk posed by contaminants to stormwater quality cannot be arbitrarily assigned to a HAIL site without understanding the nature of the HAIL activity, how stormwater migration pathways relate to the HAIL activity, the proximity and sensitivity of receptors, and the nature of on-site mitigation/management mechanisms (if any).
303. Overall, Mr Freeman and I are of the opinion that there is currently insufficient detail with regard to the management of sites included under the CSNDC where there is a possibility of contaminant entrainment and migration with sediment to a waterway. CRC Senior Scientist (Surface Water Quality and Ecology) Ms Michele Stevenson raised similar concerns in her review of the Applicant's AEE. Mr Freeman also considers that clarification is needed around what would be considered by CCC to be the benchmark for appropriate 'on-site pre-treatment'.
304. In Mr Freeman's opinion, the level of stormwater management or mitigation assigned to a site included under the CSNDC should be proportionate to the level of risk posed by that site to stormwater quality. It is also important to target management and mitigation steps, so the nature of the contaminants associated with high-risk activities are considered.

¹⁹ CRC120223 does not specify a minimum number of industrial site audits to be carried out annually; however, an agreement was reached between CCC and CRC that CCC carry out 30 audits across Christchurch City.

305. I also note that there is a risk to the stormwater management under the CSNDC (if granted), if there is no mechanism to exclude sites that are particularly high risk, sites that do not comply with CSNDC conditions or CCC's authorisations or repeat offenders that show a lack of commitment to improving the discharge quality from their sites. I am of the opinion that in these cases the Applicant should be able to revoke or not grant authorisations to discharge under the CSNDC, requiring individual site owners or occupiers to obtain a separate resource consent from CRC. Revoking or not granting authorisations should occur in agreement with CRC. If authorisation is denied or withdrawn by the CCC, the discharge would no longer be considered as a 'permitted activity' under the LWRP and CRC can enforce the requirement for these sites to apply for a resource consent under Section 15 of the RMA.

Recommendations

Overview

306. Mr Freeman recommends that for high risk sites falling under the CSNDC, in terms of stormwater management, it is ensured (at a minimum) that:
- a. Contaminants of concern relevant to that activity are highlighted with appropriate environmental benchmarks;
 - b. A robust monitoring and inspection programme is established; and
 - c. Contingencies or responses are in place to address contaminant environmental benchmark exceedances.
307. Sites which pose a moderate risk should also be subject to the same type of approach but with the lesser risk posed by these sites (i.e. when compared to risk sites) reflected in the level and frequency of monitoring.
308. I also consider that new HAIL sites that discharge into land within the site, and therefore fall within the scope of the CSNDC post 2025, should also be assigned a risk rating based on site activities and hazardous substance usage/storage at the site. The risk rating should dictate the level of control required for the site. This is addressed in more detail in the 'Effects on Groundwater Quality' Section below.
309. I also note that general mitigation measures are proposed to address discharges of contaminants for re-developments and retrofitting existing catchments, requiring first flush treatment where this is reasonable (refer to Proposed Condition 28). Although intentional or accidental contaminant spills are not to be covered by the CSNDC, the Applicant proposes that stormwater mitigation facilities constructed after the commencement of the CSNDC shall include best practice features designed to capture and contain as much as reasonably practicable, any spills of contaminants entering the facility. I generally agree with this approach.
310. However, I consider that conditions must be clear, enforceable and the phrase 'reasonable endeavours under Proposed Condition 28 is not sufficiently clear and does not provide the certainty that adequate first flush treatment will be provided for re-development sites or retrofitted catchments. I therefore recommend replacing the phrase 'reasonable endeavours' in the Proposed Condition 28 with 'all reasonably practicable measures'.

Industrial Site Audits

311. Instead of committing to a fixed target per year (i.e. ten audits per year), I consider that the Applicant should, in consultation with CRC develop an annual

programme of sites to be audited by CCC, whereby high-risk sites should be prioritised. However, I consider that the minimum number of sites should not be less than the current requirements under the existing resource consents (i.e. a minimum of 30 audits per year).

Pre-2025 Management of HAIL Sites

312. Mr Freeman recommends that until 2025, the existing MOU process could be tweaked and adopted before all sites are accepted under the CSNDC (if granted).
313. However, he also highlights that a clear strategy is required detailing how HAIL and high-risk industrial sites will be managed after 1 January 2025.

Management of HAIL Sites under the CSNDC Post-2025

314. I recommend that prior to 2025 a process/strategy is developed by the Applicant to provide certainty around the management of existing high-risk HAIL and industrial sites that fall within the scope of the CSNDC post-2025. This approach could include:
- a. Undertaking a desktop analysis of HAIL sites included on the LLUR to rank inspection priorities for industrial site audits. Rankings could be developed based on likely highest risks to water quality based on HAIL activity.
 - b. Undertaking site inspections based on this ranked list.
 - c. Developing a list of sites that pose the highest to lowest risk to water quality based on site inspections to prioritise CCC effort to work with site owners to manage risks. This process could include assistance from CRC staff; however, this would need to be subject to a separate agreement. This list should be updated regularly to include new HAIL or industrial sites.
 - d. CCC (and possibly CRC) to work with site owners based on actual level of risk to improve on-site stormwater. Development of an action plan with the site owner to address any changes in site management or new infrastructure necessary.
 - e. Each operational HAIL site discharging under the CSNDC should have an individual site management plan that details what on-site operational practices are necessary to prevent discharges of contaminants into the stormwater network.
 - f. CCC would only grant authorisations to site owners for discharging under the CSNDC if measures are in place that adequately address the potential for adverse effects on water quality. If authorisation is denied or withdrawn by the CCC, the discharge would no longer be considered as a 'permitted activity' under the LWRP and CRC can enforce the requirement for these sites to apply for a resource consent under Section 15 of the RMA.
315. I note that the above recommended approach is only a first 'step' to provide suggestions to CCC as to how such an approach could look. A resource consent condition is recommended to be included on the CNSDC (if granted) that requires CCC to develop and submit to CRC a plan for managing these high-risk sites within a certain timeframe but prior to 2025. In general, I am of the opinion that it would be beneficial for this new approach to be developed in

cooperation between the two councils, with input from both CCC and CRC experts.

316. As discussed in the 'Effects on Groundwater Quality' Section below, more comprehensive provisions are required that provide reassurance that the risk from stormwater discharges and on-site management (e.g. spilling of hazardous substances) from HAIL sites included in the scope if the CSNDC is adequately controlled post-2025.
317. I consider that any new HAIL site, or the re-development of an existing HAIL site, is likely to trigger the need for a resource consent under the Christchurch District Plan or building consent that enables CCC to consider the necessary on-site stormwater treatment. CCC would be required to review the site owner's proposed approach to stormwater management and work with the owner to ensure any on-site treatment (if required) is suitable. CCC can then provide authorisation to site owners for discharging under the CSNDC (if granted), subject to conditions such as installing specific mitigation or undertaking on-going maintenance. This should be based on an individual site management plan that describes on-going maintenance and operational practices that need to be adhered to.
318. Similar to the recommendations for construction-phase discharges, I consider that details of key CCC staff responsibilities need to be provided, and that those staff responsible for different steps in the assessment/monitoring pathway should be described. Further, the necessary training and on-going resourcing for CCC staff should be described.
319. An independent auditing process of the receipt, assessment and authorisation of discharge requests and monitoring of discharges should also be provided. This audit should be undertaken by a suitably qualified person who would review whether the agreed action plan to improve the stormwater discharges from the HAIL sites correctly identified appropriate mitigation. This audit process should be undertaken on a regular basis (e.g. once per year) for a selected number of authorisations to discharge under the CSNDC.
320. Further, if no statement is provided by the Applicant about the suitability of copper, lead and zinc to act as surrogates for the wider suite of potential contaminants, I consider that the resource consent conditions should be amended to provide a means of understanding, monitoring and reporting on contaminants from HAIL sites where there are no Receiving Environment Objectives and Targets set for these contaminants.

Conclusion

321. Mr Freeman concludes that the general intent with the proposed approach to stormwater management could have beneficial outcomes and result in the overall improvement of quality of stormwater discharges to the receiving environments. However, he raises concerns about the apparent lack of a clear strategy how high-risk HAIL sites will be managed by the Applicant once brought under the CSNDC post-2025.
322. Overall, I consider that the risk that stormwater discharges from high-risk HAIL and industrial sites pose on water quality can be adequately managed provided a clear process such as the one recommended above is in place that is supported and resourced by CCC to assist site owners with adopting adequate mitigation measures. However, as highlighted above, more information is required from the Applicant about how HAIL sites are proposed to be managed under the CSNDC post-2025, which is the outcome sought by the LWRP.

Effects on Soil Quality

Overview

- 323. The discharge of stormwater to land via infiltration devices has the potential to adversely affect soil quality as a result of the accumulation of contaminants in the infiltration media and underlying soils.
- 324. The Applicant discusses the potential effects on soil quality in Section 8.7 of the AEE.
- 325. The Applicant does not propose a specific Receiving Environment Objective or Target relating to soil quality; however, the objectives and targets for groundwater quality are relevant as the accumulation of contaminants may lead to decreased efficacy of the treatment devices. I do not consider a specific objective or target is required as the level at which Receiving Environment Objectives are set applies across the entire CSNDC, whereas impacts on soil quality will be localised where there are stormwater treatment devices.
- 326. To avoid adverse effects, the Applicant has stated that soil quality monitoring of basins is proposed. The Applicant intends to use the information obtained from the EMP to inform the maintenance requirements of all stormwater treatment devices. While new treatment facilities require an Operations and Maintenance Manual (refer to Proposed Condition 33), the Applicant has not proposed any conditions specifying that maintenance needs to occur in accordance with the results of the monitoring, or what the maintenance requirements are for existing facilities.

Soil Quality Monitoring

- 327. Six stormwater infiltration or soakage system and dry detention ponds were selected to be monitored; these are listed in included in Table 2 of the EMP. The devices are a mix of soakage basins, swales and rain gardens that receive stormwater from different land uses. The parameters sampled for in each device all include Copper, Zinc, Lead and Polycyclic Aromatic Hydrocarbons (PAHs). In addition, the monitored infiltration device that receives runoff from an industrial area will also be sampled for Arsenic, Cadmium, Chromium, Nickel, Semi-volatile Organic Compounds (SVOCs).
- 328. Mr Freeman reviewed the proposed monitoring programme, and raised the following concerns:
 - a. The proposed monitoring for the industrial area treatment device is adequate. However, it is recommended that the suite of analytes proposed for this location should be extended to all infiltration facilities monitored under the EMP.
 - b. There is a lack of information on how contaminant build up in the infiltration facilities will be addressed.
 - c. As infiltration facilities will potentially become 'contaminated' sites due to contaminant build up, the sampling should be carried out by a suitably qualified environmental specialist and in accordance with relevant Ministry for the Environment's (MfE) Contaminated Land Management Guidelines. Disposal of materials removed from infiltration facilities should also be advised by a suitably qualified professional and with CCC involvement to ensure appropriate endpoints for any material removed.

- d. Comparing soil sampling results to relevant trigger values based on the dominant land uses in the vicinity of the infiltration treatment facility, as the environmental setting is irrelevant to deriving a guideline value against which results from monitoring can be compared.

Recommendations

329. As the efficacy of stormwater treatment devices will need to be maintained over time, I consider the maintenance of devices is an operational matter for the Applicant to consider. To ensure the proposed Receiving Environment Objectives and Targets for groundwater quality are maintained, the Applicant will need to maintain all stormwater infiltration devices to ensure that the potential adverse effects of stormwater discharges on soil quality and subsequent impacts on human and ecological health can be adequately managed.
330. To ensure that the proposal adequately mitigates effects on soil quality, I am of the opinion that more certainty should be provided in the resource consent conditions around the maintenance processes for infiltration devices. This could be requirement of a general manual for all infiltration devices detailing how CCC proposes to respond to soil monitoring results from the six monitored infiltration devices, if the contaminant concentrations in soil samples posed an unacceptable risk to human health (e.g. maintenance workers) and ecological receptors. I consider that further detail is also required on how CCC proposes to apply the results from the soil monitoring in the six monitored devices to all other infiltration devices across the district.

Conclusion

331. As discussed above, Mr Freeman raised concerns about the lack of detail about monitoring and maintenance of infiltration devices and further details are required on how contaminant build up in all facilities will be addressed or how this is currently dealt with for that matter.
332. However, provided the recommendations are adopted by the Applicant, and more certainty is provided in the resource consent conditions around the maintenance processes for infiltration devices, I am of the opinion that the potential adverse effects of the stormwater discharges on soil quality will be adequately managed.

Effects on Groundwater Quality and Users

Overview

333. The discharge of stormwater onto and into land has the potential to adversely affect groundwater quality if contaminants entrained in, or mobilised by, the discharge reach groundwater resources. This poses a risk to drinking water quality, as well as stream health if groundwater emanates in nearby springs. Further, mounding effects can result in greater movement of groundwater in the localised infiltration area, which could result in the mobilisation of contaminants in soil from contaminated sites.
334. In the AEE the Applicant states that the infiltration of stormwater into land has the potential to affect Christchurch's groundwater resources, which are a vital source of drinking water for the city and also the source of base flow for urban waterways. The contaminants of concern considered by the Applicant in the application are primarily metals and pathogens.

335. The Applicant considers localised contamination to be a more likely consequence of discharging stormwater into land as opposed to widespread cumulative impacts. The Applicant also acknowledges the risks from pathogens and spills of hazardous substances as the most high-risk contaminants. As a result of indicative modelling, the Applicant estimated that *E. coli* from an infiltration basin may exceed the drinking water standards in shallow groundwater at distances up to 500 metres from the device.

Groundwater Quality Receiving Environment Objectives and Targets

336. The Applicant proposes the following Receiving Environment Objectives and Targets:
- a. Protect drinking water quality:
 - i. Maximum concentration for dissolved Copper, Lead and Zinc not to exceed 25% of MAV²⁰ to ensure investigations occur before the 50% of MAV values are exceeded; and
 - ii. No statistically significant increase in the concentration of *E. coli* at drinking water supply wells; and
 - b. Avoid widespread adverse effects on shallow groundwater quality:
 - i. No statistically significant increase in electrical conductivity.
337. CRC Senior Groundwater Scientist Mr Zeb Etheridge provided a review of the proposed objectives and targets (refer to Appendix 3 of this report).
338. Mr Etheridge generally agrees with the proposed Receiving Environment Objectives and Targets for metals, as these are appropriately conservative. However, he recommends that Cadmium be added as an Attribute Target with a target level of 0.001 mg/L, which is one quarter of the Drinking-water Standards for New Zealand's (DWSNZ) MAV of 0.004 mg/L. This is due to studies having shown that significantly higher Cadmium levels than the drinking water limit can be present in stormwater runoff in urban environments.
339. Mr Etheridge also notes that information on the natural concentrations of dissolved heavy metals in groundwater in Christchurch is currently very limited, and therefore it would be hard to differentiate between the effects of stormwater discharges and any natural variability in groundwater chemistry.
340. Regarding the target measure to ensure no increase in the concentration of *E. coli* at drinking water wells caused by stormwater, Mr Etheridge notes that no actions have been proposed by the Applicant in response to a measured increase.
341. I consider that any increase in the concentration of *E. coli* should be investigated through the proposed 'Responses to Monitoring' procedure detailed in the proposed conditions. This would allow the nature of the investigation to be determined in consultation with CRC, which would ensure that there is an adequate process in place to assess this whilst also not requiring extensive investigation and mitigation if the cause is deemed unrelated to stormwater discharges.
342. With regard to the Receiving Environment Objective to avoid widespread adverse effects on shallow groundwater quality, Mr Etheridge does not consider electrical conductivity to be a useful indicator of variations in the

²⁰ Maximum Acceptable Value (MAV) as per the Drinking-water Standards for New Zealand 2005 (Revised 2008).

concentrations of metals, particularly at the concentrations that can be expected in stormwater. This will have a negligible impact on the electrical conductivity of the stormwater, and any impact will not be apparent in the measured data. On this basis, using this parameter as a surrogate for monitoring the above metal concentrations is not considered adequate by Mr Etheridge. Mr Etheridge therefore recommends removing the objective and the associated attribute and target level.

Groundwater Quality Monitoring

343. To monitor the potential effects of stormwater discharges on groundwater quality, the Applicant has proposed to:
- a. Utilise CRC groundwater quality monitoring from wells within the City;
 - b. Utilise the groundwater quality monitoring data of CCC public drinking water supply wells which includes daily or monthly *E. coli* sampling and an annual full chemical analysis of a representative selection of wells;
 - c. Undertake a detailed investigation in 2019 to assess localised changes in groundwater quality surrounding three infiltration basins; and
 - d. Investigate complaints.
344. Mr Etheridge comments that the proposed groundwater quality monitoring programme is not actually a monitoring programme as no specific monitoring is proposed. The proposal is based on data collected from other programmes, which are not designed to assess the impacts of stormwater (refer to Appendix 3).
345. Mr Etheridge therefore recommends that a broader investigation of the effects of the consented activity on groundwater quality should be undertaken if the detailed study proposed in Section 3.2.1 of the EMP identifies the potential for stormwater discharges to ground to result in contaminant concentrations at the site boundary being above the appropriate environmental standards.
346. Overall, Mr Etheridge does not consider that the proposed groundwater monitoring programme is currently satisfactory and recommends a number of amendments to the EMP in order to make it fit for purpose.

Community and Domestic Drinking Supply

347. Section 8.4.9 of the AEE defines separation zones between stormwater infiltration facilities and water supply wells and describes special monitoring and contingency measures to be in place where wells are within these separation distances. However, the Applicant has not included these requirements in the proposed conditions. Mr Etheridge has recommended that a resource consent condition be included to give effect to the special measures described in the AEE.
348. There are already some community supply takes that are located within the proposed separation distances of existing infiltration facilities. The Applicant states that except for the Burnside pumping station, there is no indication of contamination of the water supplies as a result of the stormwater discharges.

Groundwater Quality Effects

349. Mr Etheridge reviewed the information provided in the AEE and other documents (see Appendix 3). He notes that common pollutants in discharges to stormwater systems include swimming pool or spa water, detergents and chemicals from outdoor cleaning, pet faeces, paint, and garden sprays.

However, as detailed above, Mr Etheridge considers that the focus on metals and *E. coli* is appropriate, although he recommends also including dissolved Cadmium, as this has been reported during wet weather events in excess of the DWSNZ's MAV.

350. Mr Etheridge generally agrees with the Applicant that if infiltration basins are designed appropriately, then contaminant concentrations are expected to be significantly reduced before they reach the underlying groundwater resources. The main contamination risks from stormwater are likely to arise from bacterial contamination and from spillages of hazardous substance.
351. In Mr Etheridge's opinion, spillages and discharges of toxic substances from HAIL sites represent the greatest and only major risk to groundwater quality associated with stormwater discharges, as unmanaged spillages of these contaminants onto hardstand areas of these sites have the potential to result in significant contaminant discharges to groundwater.
352. The inclusion/exclusion of HAIL sites is based on a risk classification system. The risk is determined based on whether the site is known to be or likely to be contaminated from previous land use activities, and whether this contamination could potentially be mobilised into the stormwater discharge. However, Mr Etheridge considers that the risk does not relate to the operational HAIL activity, which means that a new HAIL site (e.g. a chemical manufacture developed on a greenfield site) that discharges stormwater into land and would therefore be included in the scope of the CSNDC from 2025 would be classified as low risk.

Recommendations

Community and Domestic Wells

353. I consider it important to ensure that any water supply wells are protected from any potential localised effects on groundwater quality.
354. With regard to domestic supply wells, the Applicant proposes separation distances be adhered to for any new stormwater infiltration facility. A condition to this regard is proposed by the Applicant (see Proposed Condition 30).
355. In his review of the Applicant's AEE, Mr Etheridge notes that:
 - a. A 2,000 m separation distance may not be sufficient;
 - b. The condition only applies to domestic water supply wells; it does not refer to community water supply wells; and
 - c. No actions are proposed to identify and manage risk to private water supply wells within the influencing distance of existing infiltration devices, and the risk to these wells (if any) has not been assessed.
356. I adopt Mr Etheridge's recommended amendments to the Applicant's proposed conditions requiring that:
 - a. The separation distance should be increased to 2,500 m as a default, with the option of reducing it as per Proposed Condition 30(c);
 - b. Proposed Condition 30 should apply to both domestic and community water supply wells;
 - c. Measures be put in place to assess, and if necessary mitigate, the risk to any existing private water supply well within the specified separation distances of existing infiltration basins;

- d. For private and community water supply wells located within the default or site-specific separation distances of existing infiltration basins, further investigations should be undertaken to determine whether any water supply is at risk of becoming contaminated. These investigations should include determining whether the well is still in use, or could be used in the future, more detailed analysis and modelling and regular water quality monitoring. If the investigations identify a significant contamination risk to a well, mitigations measures should be put in place, which could include upgrades to the infiltration basin to reduce contaminant discharges, upgrade of the water supply well (e.g. deepening) or provision of an alternative water supply; and
- e. The “*assessment of site-specific information*” should be based on up-to-date research of microbial transport in aquifers and a conservative modelling approach.

Management of High-risk Sites

357. Mr Etheridge considers that the current conditions do not provide for adequate measures to manage the risk from stormwater discharges from high-risk HAIL and industrial sites to groundwater quality in the city water supply aquifers and spring-fed streams. He considers that more comprehensive provisions are required that would provide more reassurance that the risk of spillages and discharges from HAIL sites included in the scope of the CSNDC is adequately controlled post 2025. Such provisions could include:

- a. New HAIL sites after 2025 should be assigned a risk rating based on site activities and hazardous substance usage/storage at the site. The risk rating should dictate the level of control.
- b. High risk sites with discharge into land should:
 - i. Have a set of environmental limits defined, based on the potential contaminants associated with the activity. These should be certified by CRC. It is noted that there could be a wide variety of potential contaminants used, many of which are not covered by the CSNDC consent conditions and some of which may not be in the DWSNZ, and therefore an assessment of sites on a case by case basis would be required.
 - ii. Carry out regular (e.g. biannually or annually) wet weather water quality and soil sampling from infiltration basins.
 - iii. Notify CRC of any exceedance of environmental limits triggers and require the development of an action plan (to be certified by CRC), which should include, but not be limited to, investigation of the source of contamination, sampling of groundwater downgradient of the site and assessment of risk to downgradient receptors.
- c. Medium risk sites with discharge to ground would need regular audits (e.g. as part of the industrial site audits discussed above) to ensure hazardous substance management and spill response procedures are being followed by the site owner/occupier.
- d. Low risk sites would not require any specific actions.

358. As noted in the ‘Effects of Operational Discharges from HAIL and Industrial Sites’ Section above, I am of the opinion that it would be beneficial if the

approach towards managing high-risk HAIL and industrial sites is developed in cooperation between the two councils.

359. With regard to Proposed Condition 6(i), Mr Etheridge considers that it would be better to provide specific requirements for how groundwater quality effects will be assessed for infiltration basins within the catchment, particularly if stormwater discharges into land from new HAIL sites are possible within the duration of the SMP. Mr Etheridge considers that the requirements should include assessment of potential contaminant loads (including consideration of contaminant spillage scenarios on operational HAIL sites), specification of the performance standard of the infiltration basin for removal of contaminants and assessment of risk to downgradient receptors.
360. Further, with regard to Proposed Condition 21, Mr Etheridge considers that this does not provide an appropriate level of assurance that the water quality in the city water supply aquifers and spring-fed streams will be adequately protected, particularly given that the Applicant proposes to include discharges into land from high-risk HAIL sites under the CSNDC after 2025. Mr Etheridge considers that the use of 'best practice' stormwater management would be more appropriate, as proposed in Proposed Condition 32.
361. Mr Etheridge also recommends that the resource consent conditions should require appropriate separation distances between infiltration basins and landfills or other contaminated land where contamination could potentially be mobilised by groundwater mounding.

Conclusion

362. With regard to the potential adverse effects of the stormwater discharges on groundwater quality, Mr Etheridge concludes that these are unlikely to be significant provided appropriate conditions of consent are included on the CSNDC (if granted). The key recommended changes relate to appropriate separation distances between infiltration basins and contaminated land, and between downgradient receptors such as wells and springs. Further, more information is required with regard to management of high-risk HAIL and industrial sites post 2025.
363. Overall, provided the above recommendations and those detailed in Mr Etheridge's Section 42A report (refer to Appendix 3 of this report) are included as conditions of consent on the CSNDC (if granted), and the required additional information is provided at the hearing, I consider that the effects of the stormwater discharges on groundwater quality and users can be mitigated to an acceptable level to ensure there is no significant decline in groundwater quality and no health risks to groundwater users.

Effects on Groundwater Quantity

Overview

364. Stormwater systems collect rainfall and discharge it at a new location at a higher localised discharge rate. This has the potential to change the local distribution of existing groundwater levels beneath and downgradient of the discharge location (mounding) and can result in changes in stream flows as groundwater recharge (via seepage) can be affected.
365. Parts of the CCC's reticulated stormwater networks discharge onto and into land via infiltration and soakage devices (e.g. infiltration basins, soakage chambers, rain gardens, etc.), and the Applicant seeks to include these

discharges as part of the CSNDC. Other discharges into land within individual sites are also sought to be included under the CSNDC.

366. The application describes the potential groundwater quantity effects as follows:
- a. Groundwater balance: Discharges of stormwater to water in the western part of the city where groundwater recharge occurs may influence the rate of recharge and groundwater levels.
 - b. Springs: As the groundwater system maintains the base flow to the spring-fed streams of Ōtautahi/Christchurch, interception of rainfall infiltration and discharges directly to surface water can contribute to the drying up of stream headwaters.
 - c. Localised groundwater levels: Changes in groundwater levels can be expected to occur around stormwater infiltration infrastructure. Modelling exercises undertaken for some devices in Ōtautahi/Christchurch indicate that noticeable changes can occur within 100-200m of basins. If basins are sited inappropriately, the higher groundwater levels can affect neighbouring landowners.
 - d. Urban infrastructure effects: Stormwater infrastructure associated with urban development can intercept and divert groundwater located in seams of permeable gravel. If these seams are linked with spring flows or surface waterways, the base flow of streams may be affected.
367. General objectives for groundwater quantity are provided in Section 1.4.2 of the AEE, which include:
- a. *Design soil absorption basins and soakage systems to avoid [...] land drainage problems caused by high groundwater levels; and*
 - b. *Protect or enhance the water [...] quantity of springs that contribute to waterway base flows.*
368. The mitigation proposed to achieve these objectives includes:
- a. Using infiltration basins to discharge stormwater to land where this is possible, generally in the western part of the city to ensure recharge occurs and minimise impacts on spring flows;
 - b. Siting infiltration basins in areas where groundwater is sufficiently deep to avoid adverse effects of mounding; and
 - c. Construction measures utilised when installing stormwater infrastructure do not intercept or divert permeable seams away from their natural flow path.
369. The 'General City Conditions' provided in Schedule 3 of the proposed conditions require an assessment of water quantity effects for any new development, although it is not clear from the schedule if this is required for stormwater discharges onto or into land. For areas where a SMP has been developed, the SMP must demonstrate the means by which any new stormwater infiltration facilities are designed, located and operated to avoid, remedy or mitigate adverse effects of groundwater mounding on other land up to and including the critical 2% AEP rainfall event.
370. The Applicant has not proposed any Receiving Environment Objective and associated Targets for groundwater quantity, and it was agreed between CCC and CRC that any mounding and inundation effects around infiltration facilities can be dealt with at the time of SMP development. The Applicant has therefore included a clause in the Proposed Condition 5 to consider the potential adverse

effects on localised changes in groundwater levels for any new infiltration facilities constructed after the commencement of the CSNDC (if granted).

371. On this basis, I do not consider that an objective and target are required to that regard, as the adverse effects of intercepting run-off on changes in localised groundwater levels can be modelled, and measures can be implemented to mitigate potential effects, at the time of SMP development. I also note that any mounding effects from existing infiltration facilities can be addressed through the proposed EMP and response to monitoring.

Groundwater Quantity Monitoring

372. To monitor the potential groundwater quantity effects, the Applicant proposes to continue monthly monitoring of groundwater levels in a series of wells across the city. To monitor potential changes in spring flows, the Applicant proposes to rely on information provided by CRC or CCC staff, or members of the public, and then investigate any concerns to determine if mitigation measures are required.
373. To monitor the potential mounding effects the Applicant has proposed to undertake a detailed study of three infiltration basins identified in the EMP to assess localised changes in groundwater levels and the flow and quality of any nearby springs. For wider monitoring of localised groundwater levels, the Applicant proposes to rely on observations from CCC staff when assessing infiltration basin drainage following rainfall events and to respond to any complaints about land drainage issues.
374. Mr Etheridge considers that the proposed groundwater level monitoring programme is unlikely to provide useful information on the effects of stormwater interception and diversion to surface water on groundwater levels. This is because:
- a. The well locations are not targeted to where development is proposed; and
 - b. Monthly monitoring is too infrequent to show whether groundwater level response to periods of rainfall is changing as a result of urban development.
375. Mr Etheridge also considers that relying on complaints or observations to determine effects on spring flows is not appropriate.
376. Overall, Mr Etheridge does not consider that the proposed groundwater monitoring programme is currently satisfactory and recommends in his report several modifications to the water level monitoring programme. The recommended changes can be summarised as follows:
- a. Data loggers should replace the monthly groundwater level monitoring installed at five locations where significant new development is expected to take place within the consent duration.
 - b. A specific assessment of potential impacts on groundwater levels and spring flow should occur where springs are located within the potential zone of influence of new stormwater infrastructure. This would need to be assessed on a case by case basis and agreed between the Applicant and CRC.

Mounding Effects

377. Mr Etheridge considers that concentrated groundwater recharge through infiltration basins during rainfall events can cause local mounding, which could

potentially cause or exacerbate surface inundation where the water table is shallow. The potential effects of mounding, are likely to occur within close proximity to infiltration systems. These effects can also occur around detention basins, from which some seepage to groundwater would generally be expected.

378. The Applicant proposes a condition of consent requiring that CCC infiltration devices constructed after the commencement of the CSNDC (if granted) are designed, located and operated to avoid, remedy or mitigate adverse effects of groundwater mounding on other land in anything more frequent than the critical 2% AEP rainfall event. This is to be addressed at the SMP development and review stages.
379. Mr Etheridge reviewed the available information and considers that overall the mounding effects of the proposed activity are likely to be minor. Mr Etheridge generally supports the approach to address mounding effects around new infiltration basins at the SMP level.
380. Overall, I concur with Mr Etheridge that potential adverse effects of mounding can be adequately managed under the CSNDC (if granted).

Changes in Groundwater Recharge

381. Mr Etheridge considers that groundwater resources are present in the shallow unconfined aquifer system, and this shallow groundwater receives recharge from rainfall in areas where this is not diverted into stormwater systems. In his opinion, the shallow aquifer has the potential to provide a baseflow contribution to local springs and streams. Increasing the area of impervious surfaces during urban development and diverting stormwater runoff from these surfaces to retention basins and surface water has the potential to deplete the local shallow groundwater resources. This could, in turn, reduce base flows in groundwater-fed streams and rivers.
382. With regard to changes in groundwater recharge, Mr Etheridge considers in his review of the Applicant's AEE that groundwater recharge and water table elevations are likely to rise to some extent beneath developed land in the western parts of Christchurch as infiltration basins are utilised and less evaporation occurs, while water table levels in the eastern parts of the city may be lower due to discharges primarily being to surface water. Mr Etheridge states that the extent of the decline will depend on the relative importance of local land drainage to the shallow aquifer water budget.

Recommendations

383. With regard to Proposed Condition 6(j), Mr Etheridge considers that the assessment should comprise evaluation of both:
 - a. The direct local effects, e.g. impact of stormwater interception for new development proposed within the SMP period on flows in local watercourses; and
 - b. The cumulative effects, e.g. the combined effect of the interception and diversion of rainfall on groundwater levels and stream baseflow associated with all stormwater management within the catchment.
384. Mr Etheridge recommends that this assessment should be for the maximum probable development that could feasibly occur within the consent duration, or for the activities proposed within the duration of that SMP. The SMPs should also include a map of all perennially flowing springs within the catchment in

order to ensure that effects on these waterbodies are considered during stormwater management planning.

385. If the analysis shows that a significant effect is possible, Mr Etheridge recommends that the SMP should detail the measures that will be implemented to avoid, remedy or mitigate the effect.

Conclusion

386. Mr Etheridge concludes that the effects of the proposed activity on groundwater quantity are unlikely to be significant, provided the SMP for each catchment includes an appropriate assessment of localised effects and suitable catchment-specific mitigation measures where appropriate.
387. Provided the above recommendations are included for the CSNDC, if granted, I consider that potential adverse effects on changes in groundwater recharge and spring and base flows will be minor.

Effects on Surface Water Quantity

Overview

388. The Applicant has assessed the potential surface water quantity impacts of stormwater discharges in Sections 8.2.4 to 8.2.7 of the AEE.
389. In general, the discharge of stormwater can increase the risks of flooding if the flood carrying capacities of receiving water bodies are exceeded.
390. Changes to run-off patterns within catchments can also affect natural flow regimes of waterbodies as rainfall that previously infiltrated into land and contributed to base flows may be discharged directly to a water body, thereby lowering base and spring flows while increasing stream flows during rainfall events.
391. Further, point discharges into waterbodies can cause erosion of the bed and banks if water is discharged at high velocities, thereby causing water quality effects.
392. During long duration stormwater events backflow into constructed wetland can occur which has the potential to re-suspend contaminants that have settled out in previous events.

Submissions

393. Several submissions have been received relating to current and future flooding impacts as a result of the stormwater discharges under the CSNDC (if granted).
- a. Several submitters have raised concerns about flooding in the Lower Styx/Brooklands area, stating that the application contains inaccurate information and that the existing Pūharakekenui/Styx River catchment 'global' discharge permit relied on flawed predictions.
 - b. The Halswell Drainage Liaison Committee submitted on the flooding effects in the Huritini/Halswell River catchment, stating that base flows have increased, which has resulted in higher maintenance costs of the drainage network. Further, concerns were raised about future risks of flood effects.
 - c. The Little River Wairewa Community Trust seeks clarification about the responsibilities between CRC and CCC regarding drainage within and in the immediate vicinity of the Little River settlement area.

394. The submissions relating to flooding have been addressed by Mr Law in his Section 42A report (refer to Appendix 4 of this report).

Flood Risk

Overview

395. With regard to flood risks, a general approach taken in accordance with national and regional policy is to ensure that the discharge of stormwater does not result in an unacceptable risk of flooding. Acceptable flood levels are generally determined through modelling with the aim to provide a stormwater network that safeguards the catchments, properties and human lives during a design rainfall event.
396. The area covered by the CSNDC is large and has diverse stormwater catchments, which presents a challenge in assessing the water quantity effects of stormwater discharges and defining performance measures that will adequately protect against unacceptable increases in flood risk.
397. The Applicant has provided a description of flood risks in each of the sub-catchments in Section 4 of the AEE. In summary, each of the river catchments experiences flooding issues and risks, while the impacts of the 2010-2011 Canterbury Earthquake sequence have generally worsened the susceptibility to flooding because of damage to flood protection systems or changes in ground stability and ground levels.
398. Flood models will continue to be used for assessing the effects of development and different mitigation and to determine whether the Receiving Environment Targets specified in Schedule 7 of the proposed conditions are being achieved. Modelling is currently undertaken by different parties; however, to ensure consistency, the Applicant has developed 'Stormwater Modelling Specification for Flood Studies'. By ensuring the sub-catchment models that may be developed for new growth areas they can then be incorporated into the main models for the catchments and used for assessing compliance with the consent. I also understand that the Applicant is currently developing a city-wide flood model, which will eventually replace the various flood models currently being used

Water Quantity Receiving Environment Objectives and Targets

399. The Applicant proposed flood mitigation targets for the different catchments in Schedule 7 of the proposed conditions. Currently, targets have been developed for the Ōtākaro/Avon River, Ōpāwaho/Heathcote River, the Pūharakekenui/Styx River and Huriitini/Halswell River, while the targets for the Ōtukaikino and various Banks Peninsula water bodies are qualitative, focussing at not 'Partial Detention'²¹ and 'Extra-Over Detention'²² strategies, respectively.
400. The Attribute Target Levels in Schedule 7 of the proposed conditions refer to certain allowable flood level increases above a modelled baseline scenario. However, Mr Law considers that reference design flood levels may be more

²¹ 'Partial Detention' means storage within first flush basins plus additional storage through flooding of wetland areas to an average depth of 500 mm discharging over a minimum of 96 hours for the critical 2% AEP design storm event.

²² 'Extra-Over Detention' means to mitigate peak flows from development sites back to pre-development flow rates in order to mitigate effects of flooding and waterway channel erosion.

appropriate to be used to test future performance. This is discussed further below.

401. I note that no Receiving Environment Objective(s) are proposed for water quantity in Schedule 7 of the proposed conditions.
402. However, in light of Policy 4.17 of the LWRP, which requires that stormwater discharges are managed so that they do not cause or exacerbate the risk of inundation, erosion or damage to property or infrastructure downstream or risks to human safety, I consider that including a Receiving Environment Objective is adequate to ensure that the Attribute Target Levels are set in accordance with this policy. Therefore, I recommend that Schedule 7 of the proposed conditions be amended to include the following Receiving Environment Objective:
 - a. Stormwater run-off volumes and peak flows are managed so that they do not cause or exacerbate the risk of inundation, erosion or damage to property or infrastructure downstream or risks to human safety.

Review of Flood Model and Mitigation

403. Mr Michael Law, Senior Associate – Water Resources of Beca, has undertaken a review of the proposal regarding addressing the potential impacts of flooding.
404. Mr Law states that monitoring of stormwater quantity performance can only be measured against design storm events of a defined rarity or occurrence. This enables the assessment of changes in land use, development, the drainage network and stormwater mitigation measures against a baseline or pre-development scenario model results. The difference between the modelled post-development and baseline scenarios provides the relative effects of the catchment changes.
405. For the four modelled catchments, the Applicant proposes to measure the performance of the stormwater network at one location within each catchment as an allowable increase in the modelled 50-year Average Recurrence Interval (ARI) flood level, i.e. the 2% Annual Exceedance Probability (AEP), over the baseline scenario. The allowable increases are:
 - a. Pūharakekenui/Styx River – 100 mm over the 2012 baseline;
 - b. Ōtākaro/Avon River – 50 mm over the 2014 baseline;
 - c. Ōpāwaho/Heathcote River – 30 mm over the 1991 baseline; and
 - d. Huritini/Halswell River – no increase over the 2016 baseline.
406. In his review, Mr Law raises concerns about the following issues:
 - a. Number of performance monitoring locations – Mr Law considers that measuring performance at only one location in each catchment will not reflect variations in effects across the catchment. If a proposed target location is not at the outfall of the catchment, there is no mechanism for CRC to control increases in downstream flood level, which could occur with unmitigated development downstream of the target location.
 - b. Use of a single design event – Mr Law considers that measuring performance against only one design event (2% AEP) risks increases to flood depths, extents and hazard in other magnitude events occurring, which may result in CRC not being able to trigger remedial action. Mr Law states that this would be an issue if there was an increase in flooding in frequent events (e.g. up to the 10% AEP) in particular.

- c. Allowable increase in water level and baseline year – Mr Law questions why the Applicant used different baseline years for the four modelled catchments, especially since there are cross-catchment flows between catchments. While it is understood that the baseline years relate to the respective SMPs as approved under the existing ‘global’ resource consents, Mr Law considers that not having used a common baseline for all modelled catchments demotes the credibility of the flood models and questions how the differences in baseline years will be represented in future adoption of the city-wide stormwater model. With regard to the allowable increases in flood level, Mr Law considers that more information is required as to how the allowable increases in water level are set for each catchment, and whether the baseline conditions are appropriate.
- d. Absence of design flood levels – Mr Law raises concerns about the absence of reference design flood levels that will be used to test future performance, although allowable increases in design flood level are proposed by the Applicant in Schedule 7 of the proposed conditions.
- e. Re-assessment interval – Mr Law considers it likely that the Applicant will update, re-calibrate and re-run the stormwater models in the aftermath of a significant flood event; however, CCC propose to assess stormwater performance only every five years by updating the catchment land use and development; and
- f. Performance measurement in non-modelled catchments – Mr Law notes that the approaches proposed in the Ōtukaikino and Banks Peninsula catchments rely on managing flood risk at the development scale, to deliver the desired catchment-wide performance. In the absence of catchment-wide modelling, Mr Law considers managing runoff peaks and volume at the development scale a pragmatic and appropriate approach in the current situation.

Recommended Changes to Flood Model Approach

- 407. To resolve the issue around the number of performance monitoring locations, Mr Law recommends that multiple performance monitoring locations are identified in each modelled catchment. The suggested monitoring locations are identified in Table 2 of Mr Law's Section 42A report.
- 408. With regards to the modelling of multiple design rainfall events, Mr Law recommends that the Applicant reports performance against at least two flood events; the 5-year ARI (20% AEP) and the 50-year ARI (2% AEP).
- 409. The Applicant not having used a common baseline for all modelled catchments and no information having been provided as to how the allowable increases over baseline scenarios were determined represents an information gap, and justification is required from CCC as to why a common baseline was not selected.
- 410. To address the concerns around updating the flood models, Mr Law recommends that the models are also updated after re-calibration following 20-year ARI flood events. Mr Law also recommends that the 5-year performance recording interval requirement is reset after a significant event that results in recalibration of the models.
- 411. If reference design flood levels are provided by the Applicant, Mr Law accepts that these may change as a result of refinements and enhancements in flood

modelling. It would therefore be appropriate to provide a mechanism within the resource consent conditions to allow the figures in Schedule 7 to be updated

412. With regard to the non-modelled catchments, Mr Law considers that if the Ōtukaikino catchment or any of the Banks Peninsula and Port Hills catchments are modelled within the duration of the CSNDC (if granted), that the proposed conditions should reflect future opportunity to measure stormwater performance in a comparable manner to that proposed for the four modelled catchments. To facilitate this, recommended review condition should also enable the addition of reference design flood levels and Attribute Target Levels for currently non-modelled catchments in Schedule 7 of the conditions.
413. With regard to managing the Banks Peninsula and Port Hills catchments, Mr Law also recommends that peak flows, flows over longer time periods and erosion risk will need to be managed at the development scale in order to ensure that stream erosion is controlled.
414. As discussed above, while the Huritini/Halswell River SMP is authorised under resource consent CRC120223, I consider that a timelier review of the SMP would enable the inclusion of the work that has been carried out by CCC, CRC and Selwyn District Council to better understand flooding in the lower Huritini/Halswell River catchment, as well as the updated flooding levels in Schedule 7 of the proposed conditions.
415. For clarity, and to provide for the recommendations discussed above, Mr Law provided a revised Schedule 7 of the condition in Appendix B of his Section 42A report.

Conclusion

416. Based on Mr Law's review of the AEE, I consider that the effects of flooding can be adequately managed, provided the above recommendations are included as conditions of consent. Further explanation should be provided for not using a common baseline for all modelled catchments and for the adequacy of the allowable flood level increases over baseline scenarios.
417. In light of LWRP Policy 4.17, a Receiving Environment Objective is recommended to be included in Schedule 7 of the conditions to ensure that the Attribute Target Levels are set to manage stormwater run-off so that it does not cause or exacerbate the flood risk.
418. I also note that the requirement to retrofit existing developments with water quantity mitigation, where practicable, will aid in reducing flooding effects.

Implications on the Halswell Drainage District

Overview

419. The CRC manages the Halswell Drainage District, which aims to provide efficient and economic land drainage to the catchment. The maintenance of the current level of service is challenging due to the very flat gradient of the system, and ongoing increases in stormwater discharges from developments.
420. CRC Engineering Planning Advisor Jolene Irvine and CRC Asset Management Engineer Matthew Surman provided a review of the application outlining potential effects on, and concerns for the ongoing management of, the Halswell Drainage District, given the ongoing residential development and increases in stormwater and land drainage water.

Concerns Raised

421. In summary, the following concerns are raised that are related to the stormwater discharges:
- a. The proposed resource consent conditions do not recognise the distinction between land drainage and stormwater flows, and the effects of the stormwater discharges on land drainage are not currently addressed in the stormwater application.
 - b. Substantial urban development within the catchment has very likely reduced the efficiency of the drainage network and increased maintenance costs.
 - c. Additional flows increase water levels within the Huritini/Halswell River and tributary drains, which raise water table levels, reduce the effectiveness of drainage, and increase the duration of flood ponding on adjacent land. This results in productive land being under water for longer, with some areas being inundated even after small rainfall events.
 - d. Flooding targets have been included for the Huritini/Halswell River in Schedule 7 of the Applicant's proposed conditions; however, the target only relates to the peak of a modelled flood and does not include any assessment or condition regarding the duration of flooding.
422. In summary, the Halswell Drainage District is sensitive to additional stormwater and drainage flows, and the ongoing cumulative effects caused by multiple developments need to be considered by means of appropriate resource consent conditions imposed to mitigate these effects.

Recommendations

423. The key recommendations provided by the CRC River Engineering Section include:
- a. An exclusion for land drainage should be included in the resource consent conditions. If land drainage is required for any development, then a specific separate assessment of effects and authorisation should be sought, including appropriate consultation with CRC.
 - b. The flooding target for the Huritini/Halswell River should include critical duration (60 hours), and the peak flood level and the time above the 4.8 m level at Ryans Bridge shall not increase more than 30 mm and 2 hours respectively, when compared to a baseline modelled event.
 - c. A review of the Huritini/Halswell River SMP should be undertaken within two years of the commencement of the CSNDC (if granted). The review should be based on water level records from Sabys Road and Ryans Bridge, as well as further information available (e.g. modelling). Once a review of the effects within the Halswell Catchment is undertaken, a full range of mitigation options should be made available to mitigate or offset the effects of stormwater discharges within the catchment.
 - d. The CRC Regional Engineer and the relevant Drainage / River Liaison Committee should be consulted with during a development and review of SMP for the Halswell Drainage District and Wairewa/Little River Rating District.

- e. That the term 'full flood attenuation' is fully described, to provide certainty of what must be achieved. This is important for being able to agree to appropriate limits within Stormwater Management Plans, and whether additional mitigation/consent review is required.
- f. The condition providing for the CRC to serve notice of its intention to review the resource consent (Proposed Condition 55) should include a specific sub-clause on when the consent may be reviewed:
 - i. Dealing with increased duration or extent of flooding, reduced drainage, increased drainage maintenance costs or bank erosion within the Halswell catchment that has arisen due to the exercise of this consent.

Conclusion

424. Provided the above recommendations are adopted by the Applicant, I consider that the implications of the stormwater discharges on the Halswell Drainage District have been adequately addressed.

Hydrological Regime

425. In section 8.2.5 of the AEE, the Applicant describes that changes in land use can result in an increase in impervious surfaces, which reduces groundwater recharge thereby reducing base flows in water bodies during drier periods and increasing stream flow during rainfall events as less buffer storage is available.
426. The Applicant considers that these effects can be lessened by discharging stormwater into land where this is possible, or by attenuating stormwater and slowly releasing it to surface water over time. The AEE states that other practices to be considered could include setting limits to impervious cover or requiring landscape areas.
427. With the amended application, the Applicant also provided revised resource consent conditions, which require SMPs to consider if the diversion and discharge of stormwater would have any effects on base flow in streams and springs.
428. I note that there are currently no specific targets proposed and that such effects only need to be considered during the development of the SMPs. However, the effects on base flows and spring flows have to be considered during the development and reviews of the SMPs, although I am of the opinion that this consideration should include a more detailed assessment of the interception and diversion of rainfall on groundwater levels and stream base flow. As discussed by Mr Etheridge, this assessment should be for the maximum probable development that could feasibly occur within the resource consent duration, or for the activity proposed within the duration of that SMP.
429. With regards to the impacts on base flows during drier conditions, Mr Etheridge considers that resource consent conditions should be included that specify that the cumulative effects of interception of rainfall recharge to groundwater within each stormwater management catchment within a dry year shall not cause stream flows to fall below the minimum flow limit specified by Environment Canterbury. This is discussed in more detail in the 'Effects on Groundwater Quantity' Section above, and I have recommended such a condition be included on the resource consent, if granted.
430. With regard to the increased flows during a rainfall event, the Applicant has stated that typically post-development flows are managed to ensure they do

not exceed pre-development levels, and that the proposed flood targets and flood management should ensure flood flow capacity is maintained.

431. As discussed in the 'Flood Risk' Section above, I consider that the effects of increased stream flows as a result of land use changes can be adequately managed, provided the above recommendations are adopted by the Applicant.

Bed and Bank Stability

432. The Applicant proposes to follow the design standards specified in the Christchurch City Council Waterways, Wetlands and Drainage Guide 2003 (WWDG), which are considered to provide appropriate design criteria for outlet structures to avoid scouring and erosion. The Applicant considers it is unlikely that future development will cause any significant increase in erosion and scouring above current levels.
433. The Applicant also proposes amendments to the CCC's Infrastructure Design Standard (IDS) to require protection downstream of any hillside outfall to prevent erosion. The natural low gradient of the flat land catchments means velocities, and the risk of erosion is therefore considered to be low.
434. With regards to basin outlet discharges, these are proposed to be controlled to approximate the rate equivalent to pre-development conditions.
435. As discussed above, with regard to managing the hill catchments, Mr Law recommended that peak flows and erosion risk be managed at the development scale in order to ensure that stream erosion is avoided.
436. The design of facilities and conveyance systems also manage discharge velocities to minimise erosion and scour at the point of discharge.
437. The Applicant has proposed Condition 26, which requires that mitigation facilities are to be designed and constructed in accordance with the WWDG, the IDS and other approved design criteria.
438. Given outfalls and other facilities will generally follow recognised design standards, I agree that the potential adverse effects of erosion and scour as a result of stormwater network discharges are likely to be no more than minor.

Backflow into Wetlands

439. The Applicant states that constructed wetlands could experience infrequent backflow of water in long duration, low intensity rainfall events. To avoid the re-entrainment of contaminants the Applicant states that it is important the design of constructed wetlands:
- a. Ensures the inlet and outlet levels keep water velocities low; and
 - b. Allows for an additional 500 mm of freeboard (storage) above the normal operational depth which increases the discharge rate slightly.
440. I consider that any effects of backflow into wetlands is likely to occur relatively infrequently and the re-entrainment of sediments within the wetland is unlikely to be significant. Therefore, provided mitigation facilities are to be designed and constructed in accordance with the WWDG, the IDS and other approved design criteria, I consider the effects of backflow into wetlands to be no more than minor.

Surface Water Quantity Monitoring

441. The Applicant obtains surface water level information from:

- a. Twenty permanent, telemetered river gauges, which provide real time information at 15-minute intervals; and
 - b. Five project-based gauges, which are typically connected to a data logger.
- 442. River flow is calculated at eight sites.
- 443. Sea level data is obtained from NIWA at a site at Sumner Head. Tide level have been analysed based on recordings at the Styx River tide-gates, Sumner Head, Avon River at Bridge Street bridge and the Heathcote River at Ferrymead.
- 444. Rainfall depth is measured by 21 rain gauges across the city that provide real time data at intervals of 15 minutes or less.
- 445. It is acknowledged that monitoring of adverse effects of stormwater discharges on water quantity and flooding presents a different challenge when compared to the monitoring of effects on water quality where monitoring of agreed parameters against set concentrations provides a clear demonstration of whether specified standards are being met.
- 446. Mr Michael Law, Senior Associate – Water Resources of BECA, considers that the monitoring of stormwater quantity performance can only be measured with reference to flood events.
- 447. As set out in Mr Law's review of the Applicant's AEE, when monitoring stormwater quantity performance, it is generally not appropriate to include absolute performance measures such as requiring that an area does not flood under any conditions, or that a given water level is never exceeded at a certain location. This is because of the variability of flood inducing rainfall, and the risk of events greater than the design standard for stormwater systems. Instead, the performance of the stormwater network is measured using modelled performance against design storm events of a defined rarity.
- 448. Mr Law therefore considers that the only way to determine a breach of performance measures is through modelling, where environmental inputs (such as rainfall) are kept the same, while changes in land use, development, the drainage network, and stormwater mitigation measures are incorporated in flood models. The results of these models are compared against baseline (also referred to as existing or pre-development) model results. The difference in model results being the relative effects of the catchment changes. Mr Law notes, however, that flow and water level recorder data can be used to calibrate a model.

Proposed Mitigation

- 449. Proposed Condition 22 requires the consent holder to use reasonable endeavours to mitigate the effects of the stormwater network discharges on water quantity, with the effectiveness of mitigation measures to be measured against the targets set in Schedule 7 of the proposed conditions.
- 450. Other mitigation the Applicant has proposed includes:
 - a. Typically managing the peak flow runoff to pre-development levels and possibly reducing the overall discharge volume;
 - b. Using non-structural methods through the provisions of the Christchurch District Plan to avoid or manage development in flood prone areas and setting minimum floor levels;
 - c. Updating the flood models on a 5-yearly basis to inform the review of SMPs;

- d. Requiring greenfield developments that are not managed by a SMP to comply with Schedule 3 of the proposed conditions, which requires an assessment of water quantity effects as well as onsite stormwater attenuation or upgrades to the stormwater network if an increase (including cumulative increases) has a more than minor effect; and
 - e. The design of stormwater mitigation facilities serving catchments greater than 20 hectares shall include computer modelling for detailed hydraulic analysis.
451. As discussed above, the phrase 'reasonable endeavours' is not sufficiently clear and is likely to be difficult to be enforced. However, I am of the opinion that the conditions, specifically those addressing flood risks, need to be clear about what actions the Applicant will be required to take to meet the objectives and targets specified under Schedule 7 of the proposed conditions.
452. Proposed Condition 22 also seeks to measure the extent of mitigation of effects by "*the Receiving Environment Objectives and Attribute Target Levels monitoring described in Schedule 7*". While I also note that Schedule 7 does not include any Receiving Environment Objectives, the proposed condition does not require CCC to meet the Schedule 7 objectives and targets or uses these as trigger for further mitigation measures or for requiring response from CCC. This introduces further uncertainty as to what is required to achieve compliance with this condition and how this condition can be enforced.
453. On the basis of the above, I recommend that the Proposed Condition 22 be amended to:
- a. Make reference to 'all reasonably practicable measures';
 - b. Use the word 'minimise' effects as opposed to 'mitigate';
 - c. Replace 'water quantity' with a more specific reference to the effects sought to be managed by Policy 4.17 of the LWRP, i.e. 'inundation, erosion, damage to downstream property or infrastructure or human safety'; and
 - d. Measure the extent of mitigation required by implementing measures that result in achieving the Attribute Target Levels for water quantity.

Conclusion

454. I consider that it would be appropriate to include a Receiving Environment Objective for water quantity effects; e.g. as required by Policy 4.17 of the LWRP, which requires that stormwater run-off volumes and peak flows are managed so that they do not cause or exacerbate the risk of inundation, erosion or damage to property or infrastructure downstream or risks to human safety.
455. As discussed above, managing flooding risks and mitigating the potential adverse effects from flooding are critical to the successful implementation of the CSNDC. I consider that this can be achieved subject to the inclusion of Mr Law's recommendations to include additional targets and monitoring locations, and to set targets for non-modelled catchments if models are to be developed for these catchments.
456. Justification should be provided by the Applicant for having used a common baseline for all modelled catchments and further information on the adequacy of the proposed allowable flood level increases.

457. The above recommendations regarding the impacts of the stormwater discharges on the Halswell Drainage District should be adopted by the Applicant.
458. With regards to the potential changes to the hydrological regime, I consider that a more detailed assessment of effect of the interception and diversion of rainfall on groundwater levels and stream base flows is required to be included in the SPMs. On this basis, I consider that any such effects would be appropriately managed and mitigated.
459. I also note that mitigation facilities, including outfalls to water bodies, should follow the WWDG and IDS, as well as other approved standards and guidelines. On this basis, I consider that effects on stream bed and bank stability, as well as potential adverse effects from backflow into wetland, are adequately mitigated.

Effects on Freshwater Quality and Aquatic Ecology

Overview

460. Freshwater bodies in urban areas are particularly vulnerable to contamination from land uses that discharge contaminants into stormwater systems as these often discharge into local streams or rivers. Most modern industrial activities have appropriate stormwater treatment systems while many residential areas do not, in particular older residential areas where homes, commercial activities and road surfaces discharge stormwater via kerb and channel directly into waterways.
461. As discussed by Ms Stevenson in her review of the Applicant's AEE, the contaminants in stormwater have the potential to influence dissolved oxygen concentrations, total suspended sediment concentrations, nutrient concentrations, dissolved metal concentrations, hydrocarbon concentrations and faecal indicator bacteria (FIB) and pathogenic micro-organism concentrations in receiving waters (refer to Appendix 5 of this report). Many contaminants, including emerging organic contaminants, also influence the quality of the receiving environment sediment that is deposited on the bed of waterways and others influence the aesthetics of the receiving environment, for example suspended sediment.
462. Ms Stevenson further states that the effects of stormwater on receiving water quality described above have broad ranging impacts on the aquatic ecosystems that inhabit the streams, rivers, lakes, estuaries, harbours and coast downstream of stormwater inputs. In addition, sediment inputs can directly influence habitat conditions for aquatic species by smothering coarser substrates used for habitat and spawning. Further, stormwater flows can change the hydrological regime of waterways, further impacting on habitat conditions for aquatic flora and fauna.
463. The Applicant assesses the potential impacts of the discharge of stormwater on surface waterways in Section 8.2 of the AEE as well as in the amendment to the initial application provided on 9 July 2018. In summary, the Applicant considers that when appropriate mitigation is implemented, as development occurs, receiving water quality can be improved as a result. The Applicant proposes using the results of the CLM to predict future water quality and enable a targeted approach to mitigation.

Submissions

464. A large number of submitters have raised concerns about the current and future water quality in receiving water bodies (refer to Summary of Submissions provided in Appendix 9), the lack of commitment by the Applicant to improve water quality and the lack of a clear approach to managing industrial sites post 2025. Further, significant concerns are raised by multiple submitters about construction-phase stormwater discharges and sedimentation of water bodies throughout Christchurch City. These concerns have been addressed by Ms Stevenson in her Section 42A report (refer to Appendix 5 of this report).
465. With regard to the C-CLM, I highlight the following submissions:
- a. The Avon-Ōtākaro Network also raised concerns about the applicability of Auckland based data for the C-CLM;
 - b. 'Non-infrastructural' stormwater mitigation measures are endorsed by the Avon-Ōtākaro Network, the Avon Heathcote Ihutai Trust and DOC; however, commitment needs to be shown by the Applicant to follow through with the proposed measures.
 - c. The DOC submission also stated that the contaminant load models must be specific for particular SMPs.
466. I also note the joint submission from Avon-Ōtākaro Forest Park, Avon-Ōtākaro Network, Greening the Red Zone and Travis Wetland Trust, which requested in their submission that more stringent conditions and targets should be imposed to establish a clear approach and timeframe for reduction in contaminant loads entering the Ōtākaro/Avon River and its tributaries.

Freshwater Receiving Environment Objectives and Targets

467. Schedule 4 of the proposed conditions describes the Receiving Environment Objectives and Attribute Target Levels for Waterways that will be used as a benchmark to demonstrate progressive improvement of the quality of stormwater discharges, and to assess the extent of mitigation measures required to be implemented to mitigate the effects of the discharges on surface water quality, instream sediment quality and aquatic ecology.
468. The Applicant proposes the following Receiving Environment Objectives and Targets:
- a. Enhance ecological values:
 - i. Lower limit Quantitative Macroinvertebrate Community Index (QMCI) scores;
 - b. Decrease sediment input to prevent adverse effects on water clarity and aquatic biota:
 - i. Upper fine sediment (<2mm diameter) percent cover of stream bed; and
 - ii. Upper limit concentration of Total Suspended Solids (TSS) in surface water; and
 - iii. No statistically significant increase in TSS concentrations;
 - c. Reduce copper, lead and zinc levels in surface water to prevent adverse effects on aquatic biota:
 - i. Upper limit concentration of dissolved Zinc, dissolved Copper and dissolved Lead; and

- ii. No statistically significant increase in copper, lead and zinc concentrations;
 - d. Reduce nutrient levels to limit excessive growth of macrophytes and filamentous algae:
 - i. Upper limit total macrophyte cover of stream bed and upper limit filamentous algae cover of the stream bed;
 - e. Improve sediment quality to prevent adverse effects on aquatic biota:
 - i. Upper limit concentration of metals for all classifications (Copper, Lead, Zinc and Total PAHs); and
 - f. Enhance mana whenua freshwater values:
 - i. Lower limit averaged Waterway Cultural Health Index and State of the Takiwā scores.
469. Ms Stevenson considers it appropriate to include QMCI to recognise the overall goal of stormwater management to improve ecological health. However, she acknowledges that it will take more than a reduction in stormwater contaminant loads for QMCI targets to be achieved in many of the receiving waterways in the CSNDC area.
470. For the objective to decrease sediment input, Ms Stevenson agrees with the use of fine sediment percent cover as an attribute, as this is strongly influenced by sediment inputs from the stormwater network. However, I also note that fine sediment cover is influenced by other, non-network sediment sources such as rural streams and slope erosion in the Port Hills.
471. While Ms Stevenson also agrees with the proposed target levels, she notes that the fine sediment cover of many urban stream beds is at or close to 100% due to historical deposition, and therefore it may not be possible to detect the effects of stormwater derived sediment from the historical coverage. Ms Stevenson also agrees with the use of TSS concentrations as an attribute. However, she raises concerns about the appropriateness of the proposed target levels and how these were derived.
472. The objective to reduce heavy metal concentrations in surface water is considered appropriate by Ms Stevenson. She also agrees with the proposed Attribute Target Levels; however, it is recommended that a separate target level for the Cashmere Stream catchment is included. In light of revisions of ANZECC and NPF-FM, Ms Stevenson also agrees with the ability to review the Attribute Target Levels in Schedule 4 should the national guidance change as a result of the revision to ANZECC (2000) and the NPS-FM National Objectives Framework (NOF) as provided for under Proposed Conditions 45 and 46.
473. Ms Stevenson agrees with the inclusion of an objective to reduce nutrient levels but considers that assessment of data against the target levels will need to be undertaken with caution. Ms Stevenson notes that it is possible that macrophyte and algal growth rates will change irrespective of stormwater quality due to other influencing factors. In addition, macrophytes are frequently mechanically cleared from the river bed, and therefore it will be important to time macrophyte cover assessment such that results are not influenced by the clearing.
474. With regard to the objective to improve instream sediment quality, Dr Bolton-Ritchie, CRC Senior Scientist (Coastal Water Quality and Ecology), states that this is an appropriate objective for sites where sediment contaminant concentrations are above sediment quality guideline values (SQGV). However,

for sites where contaminant concentrations are currently below the SQGV, Dr Bolton-Ritchie considers that the purpose of the objective should be to maintain sediment quality to ensure that stormwater discharges do not result in a decrease in sediment quality in future. Dr Bolton-Ritchie also considers that the Total PAHs value in the Attribute Target Value should be changed to 10 mg/kg dry weight to bring the target in line with the revised SQGV (ISQG-low value) for Total PAHs.

475. Ms Stevenson generally supports the inclusion of the mana whenua values objective and the use of existing methodologies (the Cultural Health Index and the State of the Takiwā) as attributes in Schedule 4 of the proposed consent conditions. However, as discussed further in the 'Effects on Cultural Values' Section below, I consider that in the absence of comments from Ngā Rūnanga on their appropriateness, CRC is unable to comment further on the mana whenua objectives and targets.
476. With regard to high-risk HAIL sites being included within the scope of the CSNDC from 2025, Ms Stevenson questions whether it would be useful to include an additional Receiving Environment Objective addressing contaminants from high-risk sites. This supports Mr Freeman's concerns that insufficient emphasis has been placed on the potential for contaminants such as copper, lead, zinc and PAHs to be adsorbed to and transported with sediment from contaminated sites (e.g. during site development) to surface waterways. Specifically, PAHs have been highlighted as attributes which need to be considered towards improving the quality of instream sediments in waterways; however, no targets for PAHs have been set under the contaminant reduction objectives in Schedule 4 of the proposed conditions.
477. Alternatively, Ms Stevenson considers that a standard similar to those stated in Proposed Conditions 23 and 24 could be included to addresses sites with a higher risk of contaminating surface water or groundwater, whether they be industrial sites or sites with contaminated land.
478. In addition to the review provided by Ms Stevenson and Dr Bolton-Ritchie, I note that while the proposed objectives and attribute targets are related to stormwater effects, some objectives (e.g. decrease in sediment input and improvement of sediment quality) are influenced by other factors such as dewatering discharges or hill erosion runoff. This means that improvements in stormwater discharge quality may not result in significant overall improvements of instream values, and therefore measuring compliance against the resource consent conditions may prove difficult.
479. Nonetheless, provided the recommended changes to the Receiving Environment Objectives and Targets in Schedules 4 and 5 of the proposed conditions, as well as the recommended changes to the proposed conditions, are adopted for the CSNDC (if granted), I consider that the Receiving Environment Objectives and Targets, which are consistent with the freshwater outcomes sought by the LWRP, will be adequate to be used as a benchmark for progressive improvement.

Contaminant Load Reduction Targets

Overview

480. Table 2 of the proposed conditions specifies modelled stormwater contaminant loads reduction targets that the Applicant proposes to achieve by installing stormwater mitigation facilities and devices, thereby demonstrating how the targets in Schedules 4 to 6 of the proposed conditions are to be achieved.

481. It is therefore critical that the C-CLM provides an accurate estimation of contaminant loads and treatment efficiencies that informs the effective implementation of the many mitigation measures and processes proposed by the Applicant. If there is no confidence in modelled contaminant load reductions, the Applicant may be unable to achieve the proposed Receiving Environment Objectives and Targets, thereby not being able to demonstrate progressive improvement of receiving environment water quality.
482. The proposed contaminant load reductions are derived from the Christchurch Contaminant Load Model (C-CLM) report, prepared for CCC by Golder Associates (Golder Associates, 2018).

Review of C-CLM

483. A detailed review of the C-CLM approach was carried out by Dr Tom Cochrane and Dr Aisling O'Sullivan of the Department of Civil and Natural Resources Engineering at the University of Canterbury. The review report (Cochrane and O'Sullivan, 2018) is attached to Ms Stevenson's Section 42A (Appendix A).
484. The key issues and conclusions identified in the review can be summarised as follows:
- a. The contaminant load rates per land use type do not appear to have been adequately adapted for Christchurch topographic, soil and climatic conditions.
 - b. The treatment system contaminant removal rates are considered an over-estimation of the contaminant mitigation that can be expected. Questions are also raised about the adequacy of contaminant removal performance criteria, and whether the removal rates used in the C-CLM capture differences in the treatment of particulate versus dissolved metals.
 - c. There is considered to be a lack of detail regarding the rationale for some of the input parameters, which makes it difficult to understand how the model results were achieved and why certain patterns over time (i.e. between scenarios) are observed.
 - d. No sensitivity analysis has been included despite uncertainties around many of the input parameters.
485. Due to these concerns, Dr Cochrane and Dr O'Sullivan conclude that:
- a. The C-CLM results are not an appropriate predictor of the contaminant loads to be expected or mitigated in Christchurch, as the model has not been calibrated to Christchurch conditions and the mitigation scenarios present idealistic treatment efficiencies.
 - b. More realistic input values for Christchurch, calibrated to local conditions, could be used in future. However, this would result in different relative percent changes in reduction in contaminant loads, which would likely invalidate the reduction targets set in the proposed consent conditions. Even if used just for the purpose of assessing relative reductions, the scenario outputs for mitigated contaminant loads are presented as 'best case scenarios', which are unrealistic and could lead to over-estimation of the contaminant mitigation amounts that can possibly be achieved.
 - c. It is not appropriate to use the contaminant reductions predicted using current (limited) data for applying to long term conditions, including up to a 35-year period. Input data and parameters will most likely be quite

different after five plus years as model uncertainties are reduced through calibration and validation to local conditions. It is also unrealistic and undesirable to expect the C-CLM to be used over the duration of the CSNDC, as it will likely become obsolete as new and better technology to improve the prediction of contaminant loadings is developed.

486. Rather than setting static targets over a long period of time, Dr Cochrane and Dr O'Sullivan recommend that a more valid CLM approach for the CSNDC may be a requirement to model the scenarios every five years using the best available calibrated model at that time and from the modelled data, set the reduction targets for the subsequent five years in which these targets should be met.

Recommendations

487. As discussed above, the current approach is unlikely to provide a realistic picture of the load reductions actually being achieved. Ms Stevenson concurs with the review that it would be far more desirable for the future modelling to make use of the best available modelling tool at the time. This contradicts the Advice Note under Proposed Condition 18, which states the Applicant intends for the C-CLM to be the only modelling tool used to assess relative reduction in contaminant loads for the duration of the consent.
488. Ms Stevenson also raises concerns that the percentage reductions provided in Table 2 of the proposed conditions are not broken down by catchment but represent CSNDC area-wide reduction targets. Due to this, Ms Stevenson considers that it is not possible to draw any conclusions about the level of mitigation that will be achieved within the receiving waterways when the load reductions in the proposed consent conditions are specified at such a broad level. This concern is shared by Dr Bolton-Ritchie, who considers that it is not possible to determine if the reductions in stormwater contaminant loads are going to improve instream sediment quality in the areas where sediment contaminant concentrations are already above SQGV.
489. The current overall reductions under the C-CLM also mean that it will be hard to determine whether or not the NPS-FM requirements are achieved for specific catchments (Freshwater Management Units). Nonetheless, I note that overall, the Applicant proposes to work towards achieving the Receiving Environment Objectives and Targets, which are generally consistent with the LWRP freshwater outcomes.
490. I agree with these statements, and also consider that not breaking down the reduction targets into catchments poses a risk of water quality in some catchments only being maintained or even decline, while improvements in other catchments offset this in the big picture. This concern is also raised by Ms Stevenson, who considers that there is a general risk for offsetting between catchments, with large reductions achieved in one catchment where mitigation is easier to implement and increases in contaminant loads in another catchment where mitigation proves more difficult.
491. I agree with Ms Stevenson that this is unlikely to be an intended outcome. However, it is recommended that the resource consent conditions refer to the contaminant load reductions for each of the four modelled catchments to ensure progressive improvement towards LWRP outcomes in all catchments.
492. Further, Ms Stevenson considers that it is not possible to comment on what the proposed contaminant load reductions might achieve in the receiving

waterways, in terms of water quality or ecological health improvement. It is also noted that the proposed contaminant load reduction targets appear to have been set with no consideration for the Receiving Environment Objectives and Targets set in Schedule 4. On this basis, more detailed spatial information on load reductions at specific locations is recommended, which could be paired with nearby monitoring sites to provide a relative percent reduction in current concentrations. This would improve the understanding of relationships between contaminant loads and ecological indicators.

493. Therefore, to be able to make a recommendation on the adequacy of the C-CLM approach, the following information should be provided by the Applicant:
- a. Adapt the contaminant load rates per land use type for Christchurch topographic, soil and climatic conditions;
 - b. Provide justification for the treatment system contaminant removal rates used in the C-CLM. Alternatively adapt more conservative and realistic contaminant removal performance criteria that also capture differences in the treatment of particulate versus dissolved metals, or provide a sensitivity analysis;
 - c. Provide more detail regarding rationale for the input parameters used in the C-CLM;
 - d. Provide a sensitivity analysis to address uncertainties around input parameters;
 - e. Provide contaminant load reductions broken down into individual catchments modelled; and
 - f. Based on the above changes, provide revised relative percent changes in reduction from the current contaminant loads for each modelled catchment.
494. With regard to Actions (6) and (9) under the 'Stormwater Quality Investigation Actions' under Proposed Condition 37, Ms Stevenson considers that the intent of these investigations appears to address two of the concerns raised by Dr Cochrane and Dr O'Sullivan regarding use of best available modelling tools and using appropriate local data for treatment system contaminant removal rates. Ms Stevenson considers that these Actions could be included in Proposed Conditions 16 to 18, and, in combination with implementing these requirements within a relatively short timeframe, this could increase the level of confidence in the values used and the model outcomes.
495. The investigations under Actions (1) to (5) in Table 3 of the proposed conditions are supported by Ms Stevenson.

Conclusion

496. Based on the review of the C-CLM Report provided by Dr Cochrane and Dr O'Sullivan, Ms Stevenson raises serious concerns about the use of the C-CLM in its current form for the purposes that are proposed by the applicant, and also about the appropriateness of using the C-CLM over the duration of the CSNDC (if granted).
497. Ms Stevenson considers the modelled contaminant load reductions as a means for the Applicant to demonstrate commitment to improving stormwater discharge quality over time across the entire CSNDC area. However, the high-level approach means that there is no transparency about whether contaminant loads are likely to reduce or increase or stay the same on a catchment scale. Further, the proposed load reductions for TSS, total Zinc and total Copper are

considered to represent relatively small changes beyond what is already achieved by the limited amount of stormwater treatment that currently exists across the CSNDC area.

Monitoring

Freshwater Quality and Aquatic Ecology

498. The Applicant proposes monthly monitoring at 47 waterway sites within in Christchurch and Banks Peninsula. Wet weather monitoring is proposed to occur at 26 sites within the five main Christchurch river catchments on a five-yearly basis, the same year as the instream sediment quality, aquatic ecology and mana whenua values monitoring in each catchment. Two wet weather events will be monitored each year in the relevant catchment.
499. Samples will be tested for metals, pH, conductivity, TSS, turbidity, Dissolved Oxygen (DO), Temperature, Biochemical Oxygen Demand (BOD5), Total Ammonia, Nitrate, Nitrate Nitrite Nitrogen (NNN), dissolved inorganic Nitrogen (DIN), Dissolved Reactive Phosphorus (DRP) and *E. coli* or enterococci.
500. Reporting will occur annually.
501. With regard to freshwater quality monitoring under the EMP, Ms Stevenson makes the following comments:
 - a. The EMP is a key tool proposed for the CSNDC to monitor whether the Receiving Environment Objectives and Attribute Target Levels are being met.
 - b. The sections of the EMP that are relevant to freshwater quality and ecological health monitoring are considered to be very comprehensive and give an appropriate level of detail regarding site locations, frequency of monitoring, methods, and reporting requirements.
 - c. Given the spatial distribution of monitoring sites, which is mainly due to the multitude of individual stormwater discharge points and the LWRP outcomes and standards relating to receiving waterways downstream of mixing zones, it will be difficult to conclusively identify the origin of contaminants detected from the routine monitoring proposed. Therefore, additional, targeted monitoring is recommended to enable more detailed investigation of hotspot source areas and to assess the direct impact of stormwater treatment measures.
 - d. It is recommended that a specific purpose description is added to all sections of the EMP so that it is clear how each component is related to the stormwater discharge activities that fall under the CSNDC.
 - e. Surface water quality – regular monitoring:
 - i. The discontinued Heathcote River monitoring at Templetons Road should be relocated downstream to a suitable location with permanent flow that is upstream of Haytons Stream.
 - ii. The guidelines specified in Table 3 of the EMP are not applicable to all sites, particularly tidal sites that are exposed to variations in salinity throughout a tidal cycle. It would be useful if the EMP and subsequent annual reports clearly identify which sites are tidal and have variable salinity for this reason.
 - iii. Monthly sampling is a suitable frequency for the collection of water quality data used to describe the general state of receiving

environment water quality, and for a general assessment of trends over time. However, with most of the water quality samples collected in dry weather the data predominantly represents the ambient or baseflow water quality conditions, rather than wet weather conditions when stormwater discharges are occurring.

- iv. Table 3 of the EMP is a comprehensive and appropriate list of standard water quality analytes for urban streams.
 - v. A TSS target level of 100 mg/L for wet weather conditions should be included in Table 3 and the EMP should outline how the monthly data will be analysed to assess compliance with the two TSS target levels.
 - vi. The review of the water hardness data should occur in 2019.
 - vii. To account for the current review of the ANZECC (2000) trigger values for copper and zinc it is recommended that dissolved organic carbon is added to the list of parameters in Table 3 of the EMP, at least for the first year to develop a local data set from which future Hardness Modified Trigger Values can be derived.
- f. Surface water quality – wet weather monitoring:
- i. While the proposed wet weather monitoring will result in a small data set of wet weather data that will provide some useful information on first flush impacts of stormwater, the dataset is not considered to be sufficient to assess the impacts of stormwater treatment initiatives on receiving water quality during rainfall events. Such an assessment would require additional targeted monitoring.
 - ii. It needs to be clarified in the EMP whether the Attribute Target Level for TSS in wet weather conditions will be assessed using data from the wet weather monitoring programme, or whether only a subset of the monthly data will be used for this purpose, and therefore be used to measure compliance with CSNDC conditions.
 - iii. It is understood that using the rainfall event criteria currently used to determine when wet weather sampling should be carried out has proven problematic for wet weather monitoring undertaken by CCC (or consultants) to date, due to the difficulties with resourcing grab sampling during defined rainfall events. It is therefore suggested that the results of a current NIWA research project with the goal of developing new cost-effective methods for collecting stormwater and urban waterway water quality data be incorporated into the EMP if considered appropriate.
 - iv. In general, wet weather monitoring is considered more appropriate for assessing the effects of stormwater discharges, as well as compliance with receiving environment outcomes. Given the resource and funding constraints of more intensive routine wet weather monitoring, it is recommended that CCC could undertake discrete investigations of 'first flush' characteristics associated with new stormwater developments

and retrofits. Automatic water samplers triggered by changes in flow are a useful way to characterise rainfall event changes in stormwater quality and CCC could invest in auto-sampler technology, or the alternative methods being investigated by NIWA.

- v. In addition to the comments provided by Dr Lesley Bolton-Ritchie below, CCC should consider further targeted sediment quality monitoring in sub-catchments with elevated contaminant levels to aid with deducing contaminant sources and treatment options.

g. Monthly fine sediment monitoring:

- i. The proposal to introduce monthly fine sediment monitoring at sites within the Christchurch waterways is being supported. However, adequate training of staff will be required to ensure that the results are robust and useful for assessing trends over time.
- ii. A greater number of sites (four or five in each catchment) is recommended to monitor the issue of fine sediment deposition and assess changes over time at a suitable spatial scale to assist with management decisions.

h. Aquatic ecology monitoring:

- i. The large number of sites included in the aquatic ecology monitoring programme provides good spatial coverage, but the five-yearly frequency is not ideal for identifying trends that may require interventions and additional actions for mitigation. Given the likely resourcing and funding constraints, a mix of targeted annual monitoring sites and less frequently monitored sites is supported.
- ii. The aquatic ecology monitoring methods are supported.
- iii. The reporting approach for ecological monitoring presented in the EMP is generally supported. However, it would be helpful for the annual reporting to integrate the components of the EMP to aid with determining influencing factors for any spatial or temporal trends seen in the data. This requirement could be incorporated into the EMP or into the wording of Proposed Condition 53(a).

i. Lakes and wetlands:

- i. No monitoring of lake or wetland conditions or water quality is proposed in the EMP, with the exception of Horseshoe Lake, which has a predominantly urban catchment. The outlet of Horseshoe Lake is part of the monthly water quality monitoring programme; however, the monitoring does not entirely assess the condition of the lake. Therefore, water quality and ecological health should be measured in Horseshoe Lake, and appropriate criteria established to assess the impact of stormwater on the lake.
- ii. Monitoring for Te Waihora/Lake Ellesmere and Wairewa/Lake Forsyth is not considered necessary, as the effects of

stormwater discharges on the lakes are likely to be less than minor.

502. With regard to the proposed response to monitoring, Ms Stevenson considers that:

- a. Both ambient and wet weather water quality data are useful when assessing compliance for a network stormwater consent.
- b. There is uncertainty around whether chronic toxicity trigger limits (ANZECC 2000) or acute toxicity trigger limits are more appropriate to be used for intermittent stormwater discharges. However, in absence of acute toxicity trigger values that are applicable to New Zealand or more robust national guidance on appropriate compliance standards or procedures for stormwater discharge monitoring, it is appropriate to compare the monthly monitoring data to the Attribute Target Levels for compliance purposes. Ideally, the monthly monitoring should incorporate a number of days of rain event sampling that is reflective of the frequency of rain events, so that the data represent the range of concentrations that ecosystems are typically exposed to.
- c. Ideally, the assessment of chronic water quality conditions should be complemented by the use of longer-term indicators of sediment and contaminant inputs within the compliance framework, such as sediment quality and fine sediment cover. However, current sediment quality and fine sediment cover conditions in Christchurch waterways are poor and it would be difficult to directly infer any influence of current stormwater discharges or change due to current and future stormwater management practices. It is important to note that the current poor condition of sediment quality and fine sediment cover is largely a result of urbanisation and historic stormwater discharges from the CCC's stormwater network and other, direct discharges, and thus demonstrates that improved future management of stormwater is critical to improving the state of urban waterways in Christchurch.
- d. Proposed Condition 51 (response to breaches of Attribute Target Levels) does not include any timeframes for the investigation or the report. It is recommended that the investigation report be included within the annual report of the year following the exceedance.
- e. The Implementation Plan required under Proposed Condition 14 could include details of a process that prioritises how CCC will respond to issues that are highlighted via the monitoring programme.

Instream Sediment Quality

503. The Applicant proposes to monitor waterway sediments at 44 sites from Christchurch's main river catchments and four sites from Banks Peninsula. No sampling is proposed for coastal sites.

504. Samples will be assessed for particle size, metals, total organic carbon, total phosphorus, PAHs and semi-volatile organic compounds.

505. Dr Bolton-Ritchie states:

- a. The five-yearly sampling for each catchment is an appropriate time interval for sediment quality monitoring in order to be able to detect a measurable change. It is noted that while one method to assess if the contaminant concentrations are changing over time is to assess for trends, with sampling every five years at least 25 years of data will be

required for this. However, CCC have collected data from many of the sites and now have some data against which future results can be compared.

- b. The proposed sediment quality parameters are considered appropriate. However, there should be a mechanism to allow for more or different SVOCs to be measured over time.
- c. It is questioned whether the instream sediment and aquatic ecology monitoring could be aligned for the Kilmore Street/Manchester Street area, the Mona Vale area and Kā Pūtahi Creek monitoring sites.
- d. For statistical analyses a minimum of three composite samples should be analysed per site on each sampling occasion.
- e. It is recommended that the collected samples are not sieved through a sieve with a mesh size larger than 2 µm. A larger mesh size should not be used as this results in the loss of the fine sediment particles, i.e. the silts and clay which are sediment particles smaller than 63 µm. It is these fine sediment particles that metals adsorb to rather than the coarser sand particles in the > 63 µm to 2mm size range.

Mitigation and Recommendations

Rivers and Artificial Water Bodies

- 506. To give effect to the SMPs, the Applicant proposes to develop an Implementation Plan, which addresses the proposed stormwater mitigation methods and devices; proposed stormwater works; regulatory, investigative, educational and preventative activities or programmes; budgets for capital works; and reporting on any testing or water quality monitoring undertaken.
- 507. Ms Stevenson supports the inclusion of an Implementation Plan, although she questions whether Proposed Condition 13(e) should refer to a plan or programme for additional testing or water quality monitoring to check the performance of facilities or to inform prioritisation of areas for mitigation. She also comments that the associated reporting would be better placed within the Annual Report.
- 508. In addition to the required stormwater contaminant load reductions (as discussed above), the Applicant also proposes:
 - a. To develop a stormwater quality research programme to investigate the effects of improvements in stormwater discharge quality on a river's water quality improvement (refer to Conditions 35 – 37); and
 - b. Other 'non-infrastructure' measures to further demonstrate a commitment to improving the quality of stormwater discharge over time, as required under LWRP Policy 4.16 (refer to Condition 38).
- 509. With regard to Proposed Conditions 35 to 38, Ms Stevenson supports the 'Other Actions' that are proposed to be undertaken by the Applicant that will complement the infrastructural measures detailed in the SMPs, as these actions provide an indication of the Applicant's commitment to improving stormwater quality and thereby reducing stormwater effects on the receiving environment. However, Ms Stevenson suggests that the wording of the actions listed in Tables 3 and 4 of the proposed conditions be amended to ensure that the purpose and desired outcome of each action is clear. Ms Stevenson also considers that the actions in Table 4 should also be reported on, which would

require the addition of Proposed Condition 38 to the group of conditions listed under Proposed Condition 53(a).

510. However, with the current wording of the 'Other Actions', Ms Stevenson also considers there to be a high risk of many of the actions beyond feasibility studies not being progressed due to lack of funding and staff resourcing, unless there is some independent input into the decision making for these investigations. It is therefore recommended that an independent opinion or review be provided on the results of feasibility studies, which could be carried out by relevant members of the Stormwater TAP that is also recommended to be tasked with the SMP certification.
511. As discussed in the sections above, Ms Stevenson also considers that insufficient detail has been provided on how high-risk HAIL sites and construction-phase stormwater discharges will be managed post-2025. Ms Stevenson highlights that these sites pose a significant risk to receiving environments if stormwater discharges from these sites are not adequately managed. In addition to the recommendations by Mr Freeman, Ms Stevenson also recommends that the existing SMPs be amended to include details at a catchment scale (refer to 'Adequacy of Use of Stormwater Management Plans' Section above).
512. With regard to the 'response to monitoring' in the proposed conditions, Dr Bolton-Ritchie notes that there is no planned response for sediment contaminant concentrations. However, there is a response if Attribute Target Levels for Copper, Lead and Zinc in surface water are not being met. If corrective actions/remediation is required for these surface water contaminants, then sediment contaminant concentrations will likely not increase and may decrease over time.
513. Dr Bolton-Ritchie therefore recommends that a condition is included that requires corrective actions or remediation for sites where the concentration of one or more sediment contaminants is above SQGV-high. She also recommends a condition requiring a response when one or more sediment contaminants are above SQGV. This should be in line with Proposed Condition 51. As an alternative to these conditions, a SQGV exceedance could trigger a Weight of Evidence approach, which integrates four major lines of evidence comprising chemistry, toxicity, bioaccumulation and ecology.

Lake Environments

514. There are two large lakes within the CSNDC area, Te Roto o Wairewa/Lake Forsyth and Te Waihora/Lake Ellesmere. Stormwater discharges from Little River will ultimately discharge to Te Roto o Wairewa/Lake Forsyth, while discharges that enter the Halswell catchment will ultimately discharge into Te Waihora/Lake Ellesmere. The potential impacts of stormwater discharges on lake water quality are similar to that of the impacts on freshwater bodies.
515. The Applicant states that there is unlikely to be measurable impacts of stormwater discharges on these lakes, and no specific Receiving Environment Objectives or Targets are proposed that apply to lakes. There are also no monitoring sites at these two downstream receiving environments.
516. Ms Stevenson generally agrees with this statement; however, as discussed above, monitoring is proposed for Horseshoe Lake to ensure there are no measurable adverse effects as a result of the proposal.

Freshwater Ecology

517. Contaminants entrained in stormwater discharges can adversely impact on aquatic biota. Fine sediment deposition on the stream bed can be directly harmful to fish via gill abrasion, prevent successful spawning and impact on the abundance of food.
518. Some submitters have raised concerns about the effects on ecology, and as discussed above, there is a key concern about the maintenance of water quality and the uncertainty that effective mitigation measures will be implemented over the duration of the resource consent (if granted). The C-CLM suggests that with best practice mitigation, key contaminant concentrations and loads in stormwater discharges can be reduced. Even if the LWRP water quality outcomes and standards may not be met for some contaminants, the reduction in contaminant loads can result in a gradual improvement of ecological values. This should be considered in the context of whether or not the C-CLM, as proposed, is appropriate to adequately demonstrate the Applicant's commitment to improve the quality of the receiving environments under the CSNDC.
519. The Applicant states that lower water quality is generally recorded in urban areas, and Ms Stevenson considers this to be also applicable to ecological and habitat condition for waterways within the CSNDC area.
520. The Applicant also acknowledges that within the CSNDC area there are some sites with high ecological importance and in these areas additional mitigation measures should be adopted to protect these values. However, this has not been addressed in the proposed conditions.
521. I consider that additional mitigation for sites with high ecological values are best addressed on an SMP level. Therefore, I consider that the additional requirement for SMPs should be included under Proposed Condition 6, as recommended by Ms Stevenson, i.e. the identification of areas of high aquatic ecological or cultural value, including but not limited to springs and wetlands, and habitat for threatened species (refer to Adequacy of Use of Stormwater Management Plans' Section above).
522. Further, as discussed above, Ms Stevenson also recommends that an assessment of water quality modelling results in terms of potential impact on the state of the receiving water ecology is included in the requirements for SMPs. Based on this assessment, freshwater ecology mitigation measures can be developed specific to the catchment.
523. Ms Stevenson considers that best practice stormwater treatment for greenfield development, retrofitting treatment in developed areas, robust erosion and sediment control for construction sites, on-site pre-treatment for industrial sites discharging to the CCC's network and natural waterways, exclusion of sites where construction is to take place on contaminated land and non-infrastructure approaches are positive steps in the right direction. However, improvements within the receiving environment as a result of improving the stormwater discharge quality may not be evident in some instances as aquatic ecosystems within waterways impacted by urbanisation are also affected by a range of factors that are not directly associated with stormwater discharges. It will therefore also be important for the Applicant to promote other measures outside of the CSNDC (e.g. improvements in riparian health), to improve the overall ecosystem health of waterways over time.

Summary

524. In summary, Ms Stevenson considers that:

- a. The effects on surface water quality will be mitigated by treatment measures and estimated in the SMPs by contaminant load models. However, this is highly dependent on the accuracy of the models used and monitoring results will be a key factor in determining whether improvements are being realised.
- b. With regard to effects on aquatic ecology, there is insufficient information to enable a full assessment of effects of the stormwater discharges on ecological health.
- c. There are unlikely to be any measurable effects of the stormwater discharges on Te Waihora/Lake Ellesmere and Wairewa/Lake Forsyth. However, potential effects of the discharges on other smaller lakes and wetlands within the CSNDC area (e.g. Te Oranga/Horseshoe Lake) have not been considered. Any effects are recommended to be determined via monitoring and establishing appropriate criteria to assess the impact of stormwater on Te Oranga/Horseshoe Lake.

525. With regard to the receiving environment sediment quality, Dr Bolton-Ritchie considers it is critical that the stormwater from industrial and HAIL sites is well managed, as these sites are a potential source of contaminated sediment and other potential surface water contaminants including metals, PAHs, SVOCs and other emerging contaminants that have the potential to affect sediment quality.

526. As discussed previously in this report, the phrase 'reasonable endeavours' is not sufficiently clear. This phrase is likely to be difficult to enforce, and there needs to be certainty around the actions required to be taken by the Applicant to meet the objectives and targets specified under Schedule 4 of the proposed conditions. For the reasons outlined above, I therefore recommend replacing 'reasonable endeavours' with 'all reasonably practicable measures' in Proposed Condition 20.

Conclusion

527. Ms Stevenson concludes that:

- a. In general, the overall approach proposed by the Applicant is likely to result in an overall improvement in the receiving waterways. Key to this are the SMPs, which outline catchment- or area-specific stormwater issues and mitigation measures, and a research programme to investigate knowledge gaps and implement other actions that will aid with improving waterway outcomes.
- b. However, there is insufficient spatial detail within the application and too much uncertainty around the CLM approach and future implementation of the resource consent (e.g. around the management of high-risk sites post-2025) to be able to conclude what the likely effects of stormwater discharges might be into the future. Recommendations are made to address these areas of concern.
- c. The adaptive management approach will require frequent review of SMPs in response to results of the EMP and the investigations programme, and potential changes to regional and national planning instruments, to ensure that there is progressive improvement towards the outcomes for each catchment within the CSNDC area.

- d. The Objectives and Target Levels for waterways are well aligned with the LWRP outcomes and standards. Commitment to improve the receiving environments has been demonstrated through the proposed consent conditions. However, a key concern is the lack of certainty around implementation and efficacy of mitigation measures and thus uncertainty around when outcomes might be achieved.
 - e. The C-CLM review has identified significant assumptions that raise questions about the suitability of the approach for the CSNDC, and about the appropriateness of using the C-CLM into the future.
 - f. A review clause should be included for the CSNDC (if granted) to account for future changes to stormwater and urban waterway management that have been signalled at a regional (e.g. LWRP Sub-regional Section development) and national (e.g. likely changes to NPS-FM).
528. Over the CSNDC area, I consider that a significant overall decline in ecosystem health can be avoided and that water quality improvements can be achieved under the CSNDC, provided the resource consent conditions are robust in requiring the Applicant to progressively improve the stormwater discharge quality to work towards meeting the Receiving Environment Objectives and Attribute Target Levels. While the accuracy of modelled contaminant loads and treatment efficiencies is uncertain, the purpose of contaminant load reductions is a measure for the Applicant to demonstrate commitment to improving discharge quality and effective implementation of the proposed mitigation measures and processes. This is in general accordance with Policy 4.16 of the LWRP.
529. I am of the opinion that the CSNDC proposal has positive intentions. However, to be able to reach a conclusion on whether significant improvements in the overall freshwater quality ecosystem health are likely to occur more detailed information is required on the management of stormwater discharges from development and high-risk sites.
530. Overall, if more clarity around the reduction targets in the C-CLM and more certainty around implementation and efficacy of mitigation measures is provided, and the other recommendations are adopted as conditions of consent for the CSNDC (if granted), I consider that the proposal provides an approach that aims to meet the Receiving Environment Objectives and Targets. A clear commitment to work towards meeting the objectives and targets would also demonstrate consistency with LWRP Policy 4.16.

Effects on Coastal Water Quality and Aquatic Ecology

Overview

531. The Applicant described the potential effects on coastal environments and the Ihutai/Avon-Heathcote Estuary in Sections 8.5 and 8.6 of the application. Stormwater from the reticulated network may be discharged directly to the coastal environment (e.g. in Sumner and Lyttelton Harbour). The coastal environment is also the ultimate receiving environment for most stormwater discharges to surface water as the waterways drain to estuaries and the open coast. The potential impacts of stormwater discharges depend on the nature of the receiving environment. The effects of the discharge will be different depending on whether the receiving environment is an open coast, a sheltered harbour or an estuary.

532. The Applicant states that stormwater discharges to the coastal environment have the potential to introduce contaminants and sediment that can have a number of potentially adverse effects:
- a. Sediment laden water can cause discolouration that may affect visual amenity and clarity in the water column that could impact on recreational users, as well as marine species that are visual feeders.
 - b. Sedimentation may also occur, causing smothering of benthic species and feeding grounds for other species.
 - c. Stormwater discharges have the potential to introduce contaminants that may be toxic to marine life into the water column.
533. The Applicant considers that given the nature of tidal influxes and the large-scale dilution associated with discharges into the coastal environment, any effects from the discharge of sediment in stormwater discharges are likely to be small-scale and temporary. Given the intermittent and short-term nature of stormwater discharges, the concentration of contaminants in the water column is considered to reduce significantly within a small number of tidal cycles. However, it is acknowledged that this dilution may not be the case for discharges to harbour environments, where tidal and wave action provide less dilution.
534. Overall, the Applicant proposes monitoring to improve knowledge and better quantify the nature and scale of effects that stormwater may be having in areas such as Whakaraupō/Lyttelton and Akaroa harbours. The results of this monitoring and the reporting of it in the annual monitoring report will inform the management approach taken by CCC to address any effects attributable to stormwater discharges.
535. With regard to effects of the stormwater discharges on Ihutai/Avon-Heathcote Estuary, the Applicant considers that any future effects on estuarine ecology can be minimised by retrofitting existing catchments and improving discharge quality to the City waterways.

Submissions

536. The Lyttelton Port Company has raised concerns about water quality of the Lyttelton Harbour due to stormwater discharges.
537. The Avon-Heathcote Ihutai Trust states that stormwater discharges have the most detrimental impact on the Avon-Heathcote Ihutai estuary.

Coastal Water Objectives and Targets

538. The Applicant has proposed three objectives for coastal waters. The objectives and their associated targets are:
- a. Reduce sediment input to prevent adverse effects on water clarity and aquatic biota:
 - i. No statistically significant increase in Total Suspended Solids concentrations;
 - b. Decrease copper, lead and zinc levels in water to prevent adverse effects on aquatic biota:
 - i. Maximum dissolved metal concentrations for all classes with the exception of the Operational Area of the Port of Lyttelton; and

- ii. No statistically significant increase in copper, lead and zinc concentrations; and
 - c. Enhance mana whenua freshwater values:
 - i. Minimum averaged Marine Cultural Heath Index and State of Takiwā scores for all classes.
539. Dr Bolton-Ritchie has audited the assessment of effects of the proposal on the coastal environment. In relation to the Receiving Environment Objectives and Targets, Dr Bolton-Ritchie states:
- a. It is appropriate for TSS and dissolved metals concentrations to be environment target values. However:
 - i. With regard to TSS, this should also refer to a 'decrease in TSS concentrations' rather than only to 'no statistically significant increase in TSS concentrations'.
 - ii. The target values for dissolved metals are not in line with the objective as 'no statistically significant increase' does not mean a 'decrease' in dissolved metals. It is therefore recommended that the Attribute Target Level also includes the statement '*a statistically significant decrease in copper, lead and zinc concentrations*'.
 - b. The proposed target values for dissolved metals are derived from the RCEP. However, the values in the RCEP are different to those in ANZECC (2000). For the estuary and all coastal sites, the ANZECC (2000) 95% species protection values should be used, except the Operational Area of the Port.
 - c. With regards to the Operational Area of Lyttelton Port, there are multiple sources of dissolved metals to harbour water; however, stormwater discharges should not have the capability of causing significant adverse effects on aquatic life or the capability of causing a significant loss of indigenous biological diversity. An investigation is recommended to determine the dissolved copper, lead and zinc concentrations from stormwater discharges from the urban areas of Lyttelton that discharges to the port area. The results can then be used to determine the extent of mitigation required to ensure the impact of the discharged stormwater on the copper, lead zinc concentrations within the operational area of the port is no more than minor.
540. In light of the objectives in Schedule 5 of the proposed conditions, which are to 'reduce' sediment input to prevent adverse effects on water clarity and aquatic biota, and to 'decrease' dissolved metal concentrations in coastal water to prevent adverse effects on aquatic biota, I agree with the additions of the recommended Attribute Target Levels requiring a decrease/reduction in addition to 'no statistically significant increase' of TSS and dissolved metals. On this basis, I have recommended corresponding amendments to Schedule 5 of the proposed conditions.
541. Based on Dr Bolton-Ritchie's advice, and provided her recommended changes to the Attribute Target Levels are adopted, I consider that the TSS and dissolved metal concentrations are appropriate to be used for the assessment compliance against the Proposed Condition (7).
542. As noted above, with regards to the mana whenua Receiving Environment Objective and Target, in absence of comments from Ngā Rūnanga, I am unable

to conclude whether the coastal mana whenua Receiving Environment Objective and Target are suitable.

Coastal Water Quality Monitoring

543. The Applicant proposes monthly monitoring of the coastal water quality environment in Christchurch and Banks Peninsula at four locations.
544. Wet weather monitoring is proposed to occur at four sites from coastal areas on a five-yearly basis, the same year as the instream sediment quality, aquatic ecology and mana whenua values monitoring in each catchment. Two wet weather events will be monitored each year in the relevant catchment.
545. Samples will be tested for metals, pH, conductivity, TSS, turbidity, Dissolved Oxygen (DO), Temperature, Biochemical Oxygen Demand (BOD5), Total Ammonia, Nitrate, Nitrate Nitrite Nitrogen (NNN), dissolved inorganic Nitrogen (DIN), Dissolved Reactive Phosphorus (DRP) and *E. coli* or enterococci.
546. Reporting will occur annually.
547. With regard to coastal water quality monitoring under the EMP, Dr Bolton-Ritchie makes the following comments:
 - a. The proposed four estuarine and coastal monitoring sites are suitable sampling sites. However, an additional coastal monitoring site is recommended within the Ihutai/Avon-Heathcote in proximity to where either the City Outfall Drain or the Charlesworth Drain flows into the estuary.
 - b. The parameters listed in Table 3 of the EMP are considered appropriate to measure the effects of stormwater discharges.
 - c. Monthly sampling is a suitable frequency for the collection of water quality data used to describe the general state of receiving environment water quality, for a general assessment of trends over time, and for an assessment of the copper, lead and zinc against the trigger values. However, it is not considered appropriate to use monthly data to determine whether the receiving environment Objectives and Target Attribute Levels are being met when stormwater is actually being discharged.
 - d. Monitoring around rainfall events (wet weather monitoring) would be more appropriate. To enable an assessment of whether the overall objectives for coastal water are being met, at least three or more samples should be taken annually during or immediately after rainfall events. The data should then be grouped for state and trend analyses into dry weather and wet weather sampling. The collection of wet weather samples could be achieved by collecting additional sampling over and above the routine monthly sampling programme or having a more flexible monthly sampling regime. The results from this annual wet weather sampling could then be used to assess whether the proposed receiving environment Objectives and Attribute Target Levels are being met when stormwater is flowing into the receiving environment
 - e. Sampling at the Beachville Road site in the estuary is undertaken around the time of high tide and that this information is included in the EMP. At the other coastal sites, the time of sampling does not need to be determined by the state of the tide.
 - f. Monitoring is not necessary for nutrients (nitrogen and phosphorus-based parameters) at any of the coastal sites.

- g. Faecal coliform concentrations should also be measured at the Akaroa Harbour because due to the RCEP water quality classification of Coastal SG.
- h. For the dissolved metal concentrations, the ANZECC (2000) values should be used rather than RCEP to determine whether the receiving water meets the requirements for the maintenance of aquatic ecosystems. This will align the dissolved metal concentrations for annual reporting with those in Schedule 5 of the proposed conditions.
- i. A TSS value should be incorporated into Table 3 of the EMP and into Schedule 5 of the Proposed Conditions once this becomes available for Canterbury open coastal water and the water in Lyttelton Harbour/Whakaraupō and Akaroa Harbour.
- j. The guideline value for the faecal indicator bacterium enterococci in Table 3 of the EMP for the Beachville Road monitoring site in the estuary should be the same as that for Cass Bay and Akaroa Harbour.
- k. To assess the water quality for shellfish gathering, the faecal coliforms data should be assessed against the MfE/MoH (2003) guidelines for water over lying shellfish; i.e. the median concentration of faecal coliforms should not exceed 14/100 mL and the single sample concentration of 43/100 mL should not be exceeded in more than 10% of the samples. Shellfish flesh testing for metals in shellfish is recommended if concentrations in surface water exceed guideline values.

Coastal Water Quality and Ecology Mitigation

- 548. Dr Bolton-Ritchie agrees with the Applicant that there is very little information about the current impacts of the stormwater discharges on coastal water in the CSNDC area.
- 549. Dr Bolton-Ritchie describes how particles within a discharge into coastal water settle out around outlets and can affect the presence and abundance of benthic invertebrates.
- 550. As discussed in the Effects on 'Freshwater Quality' Section, there needs to be certainty around the actions required to be taken by the Applicant to meet the objectives and targets specified under Schedule 5 of the proposed conditions. For the reasons outlined above, I therefore recommend replacing 'reasonable endeavours' with 'all reasonably practicable measures' in Proposed Condition 20, which also applies to Schedule 5 of the proposed conditions.
- 551. With regard to the response not meeting the Attribute Target Levels in Schedule 5 of the proposed conditions, the steps described under Proposed Condition 51 are required to be taken, including investigating the cause of the exceedances and remedial actions to mitigate effects if they are a result of the stormwater discharges.
- 552. Dr Bolton-Ritchie considers that there could well be situations where the attribute target levels are exceeded at more than one coastal site. With regard to the response to such events, she notes that either timeframes for each report must be stipulated in Condition 51, or it must be assumed the reports must be completed by 30 of June each year, as discussed on page 58 of the EMP and in Proposed Condition 53(e). This will need to be clarified.
- 553. For the coastal sub-catchment which drains the coastal areas from the Waimakariri River, around the Ihutai/Avon-Heathcote Estuary and the Port Hills

to Godley Head, the Applicant proposes to maintain the current receiving environment. As discussed, there is little information available to determine what the current effects are of the stormwater discharges on coastal water quality and ecology. The Applicant proposes to use time trends analysis to determine changes in receiving environment quality, which, so the Applicant, would provide confidence for determining any changes in coastal water quality that occur over time as a result of the stormwater discharges.

554. As discussed above, Dr Bolton-Ritchie considers that for coastal water the main goal for the receiving environments, where the existing conditions are already met and are well below the Attribute Target Levels, should be to maintain the quality of the existing receiving environment while ensuring that stormwater discharges do not result in degradation of the receiving environment into the future. Therefore, being below the Attribute Target Levels for the heavy metals or TSS should not mean that there is no need for future management if Attribute Target Levels are not exceeded yet.

Conclusion

555. Overall, I consider that the effects of the stormwater discharges on the receiving coastal environment can be adequately mitigated, provided the targets in Schedule 5 of the proposed conditions are amended to include a requirement for a decrease in TSS and dissolved metals concentrations, as recommended by Dr Bolton-Ritchie above.
556. I also note that improving the discharge quality and retrofitting existing freshwater catchments, where practicable, will contribute to improvements in water quality in coastal and estuarine receiving environments. However, the degree of improvements is dependent on the management of construction-phase stormwater discharges and discharges from high-risk sites under the CSNDC (if granted), and also on more certainty relating to a reduction of contaminant loads for the catchments contributing to coastal water and estuaries.

Effects on Amenity and Recreational Values

Overview

557. Stormwater discharges can result in changes to river flows and poor water quality can impact recreational use including water sports and shellfish gathering, which is mostly attributed to microbial contamination (e.g. from faecal coliforms).
558. The Applicant has described the potential adverse effects on amenity and recreational values in Section 8.9 of the AEE.
559. There are no specific objectives or targets proposed for amenity and recreational values. However, I consider that the proposed objectives and targets for water quantity and quality (both freshwater and coastal) are suitable to assist in managing the potential amenity and recreational effects.
560. The Applicant stated that given receiving water quality is predicted to be the same or better than the current state and flooding is not expected to increase in frequency or severity, it is unlikely there will be any significant adverse effects.

Submissions

561. Submissions received by the Arawa Canoe Club and F K Fraser raised concerns around water quality in the receiving environments being unsuitable for water sports (kayaking, canoeing, etc.).

Contact Recreation

Freshwater

562. The discharge of microbes can result in bacteria concentrations exceeding recreational guidelines. While there are many urban sources of pathogens (particularly direct contributions from water fowl and domestic animals or wastewater overflows to river and streams), stormwater discharges from the reticulated network are unlikely to be the most significant source. As discussed above, Ms Stevenson agrees with the Applicant that a faecal coliform target is not necessarily appropriate due to the major sources of faecal coliforms not being stormwater driven.
563. I also note that other faecal coliform sources such as CCC's wastewater network overflows are covered by a separate resource consent, which seeks to reduce frequency of discharges to waterways. Nonetheless, there remains a contamination risk from misconnections to the stormwater network (e.g. greywater).
564. However, while Ms Stevenson considers that *E. coli* should still be monitored and compared to guideline values as proposed in the EMP, compliance with this standard is not necessary due to the other microbial contaminant sources.
565. Ms Stevenson also noted that the Applicant should consider education of dog owners as part of any community education around stormwater that is rolled out. I agree with this and recommend that this be included as part of the 'Other Actions by the Consent Holder' proposed by the Applicant.

Coastal Water

566. For contact recreation the main concern is, similar to freshwater, the concentration of faecal indicator bacteria in water and hence the likely presence of pathogens.
567. For the coastal water to be managed for contact recreation under the RCEP (Coastal CR water classification applies for Cass Bay, Akaroa Harbour, Lyttelton), Dr Bolton-Ritchie comments that the faecal indicator bacterium enterococci is used to assess the water quality for contact recreation in sea water, which she considers appropriate.
568. I also note that stormwater treatment proposed under the CSNDC may reduce microbial contaminant concentrations in the discharge, and therefore the impacts of microbes discharged in stormwater are likely to be minor.
569. As discussed, not much information is available on the actual effects of the stormwater discharges on coastal water quality. With regard to the impact of contaminants other than faecal coliforms on recreational values, Dr Bolton-Riche considers that without targeted wet weather sampling, the annual assessment of water quality data will at best only provide an indication of whether the Receiving Environment Objectives and Attribute Target Levels for stormwater discharges are being met. Otherwise, only an indication of progress towards achieving the Objectives and Attribute Target Levels would be provided.

570. In summary, there is insufficient data available to determine the scale of effects of the other contaminants entrained in the stormwater network discharges on amenity and recreational values associated with coastal water. On this basis I cannot conclude as to whether these effects would be reduced.

Shellfish Gathering

571. The quality of the stormwater network discharges can influence the suitability of estuarine or coastal water for contact recreation and shellfish gathering, where a significant concern is the concentration of faecal indicator bacteria in water and hence the likely presence of pathogens. Metals and other contaminants in stormwater also have the potential to contaminate shellfish flesh, and food safety guideline values for shellfish flesh exist for mercury cadmium, lead and arsenic.
572. Only the Akaroa Harbour has a classification of Coastal SG water, and therefore the water quality must be managed for shellfish gathering.
573. With regard to the effects of the stormwater discharges on shellfish gathering, receiving water faecal coliform concentrations need to be measured. Dr Bolton-Ritchie recommends that receiving water faecal coliform concentrations are measured and compared against MfE/MoH (2003) guideline values for water over lying shellfish. If the guideline values are met it is an indication that the shellfish will not contain high concentrations of faecal indicator bacteria (and hence pathogens), and therefore would be safe to eat. If the guideline values are not met it is an indication there is a potential health risk for those collecting and eating shellfish from the area around the site. If the guideline values are not met, signage warning against collecting and eating shellfish from the area must be erected by CCC.
574. On this basis, it is recommended that Table 3 of the EMP is updated to include the faecal coliforms as a parameter and the MfE/MoH (2003) guidelines for water over lying shellfish be in the coastal guideline level. CCC will need to undertake an investigation and take actions that result in a reduction in faecal coliform concentrations in the stormwater.
575. Dr Bolton-Ritchie also recommends that if the water quality monitoring results indicate that dissolved metal concentrations at the Akaroa site are above guideline values, the flesh of the shellfish species that occur in proximity to the sampling site should be assessed for cadmium and lead concentrations. The results obtained must be compared to food safety guidelines and the follow-up actions should be dictated by the results obtained.

Conclusion

576. Overall, I consider that the potential adverse effects on amenity and recreational values are primarily tied to the concentration of faecal indicator bacteria in water and hence the likely presence of pathogens. Although there is some potential for stormwater discharges to contain faecal coliforms, I agree with Ms Stevenson that stormwater is not the primary source of faecal contamination, and that educational programmes would help to reduce contaminant sources (e.g. from domestic animals).
577. Overall, provided monitoring is carried out on a regular basis, I consider that potential adverse effects on amenity and recreational values can be adequately addressed.

Effects on Cultural Values

Overview

578. The discharge of stormwater can affect cultural values such as mahinga kai, the mauri of water and other cultural values associated with freshwater and land.
579. The Applicant has assessed the potential effects of the proposal on cultural values in Section 8.8 of the AEE. The assessment discusses the engagement that has been undertaken and there is overall support for an integrated approach to managing stormwater discharges but that there are a number of concerns that remain, particularly where there is uncertainty. Further information on consultation with Ngā Rūnanga was provided with the amended application letter received by CRC on 9 July 2018, in which the Applicant states that an agreement regarding the proposed conditions and the submission by the Ngai Tahu parties on the initial application CRC160056 has almost been finalised.
580. I note that Ngā Rūnanga has not submitted on the amended application CRC190445.
581. In general, the Applicant proposes to continually engage and collaborate with the Rūnanga regarding the implementation of the CSNDC. Further a Receiving Environment Objective is proposed in Schedule 4 of the proposed conditions to enhance mana whenua freshwater values with target for waterways and coastal water measured by Cultural Health Monitoring which is proposed to be developed specifically for the CSNDC.
582. SMPs are to include an interpretation of cultural monitoring and how this information has been used to develop water quality mitigation methods and practices. Catchment-specific Cultural Impact Assessments (CIAs) are also proposed to be included in every SMP.
583. The Applicant does not specifically conclude how significant the potential cultural effects will be but their overall conclusion on the potential effects is that they will be no more than minor.

Mana Whenua Values Monitoring

584. To assess the potential effects of stormwater discharges on mana whenua values the Applicant proposes to monitor several sites across Christchurch City and Banks Peninsula. The monitoring will include three State of the Takiwā monitoring methods, the Takiwā general site assessment, the cultural health index waterway assessment and the marine cultural health index assessment.
585. To date, no feedback from Ngā Rūnanga has been provided regarding whether the proposed monitoring of mana whenua values is adequate or sufficient. I am therefore unable to reach a conclusion on the appropriateness of the monitoring proposed.

Conclusion

586. It is understood that Ngā Rūnanga and CCC have reached an agreement regarding the proposed resource consent conditions and the submission by Ngā Rūnanga on the initial application CRC160056. These matters will need to be further considered throughout the hearing process.
587. I also note that the Applicant has not proposed any mana whenua value for groundwater quality and quantity or springs. I consider that further comment

from Ngā Rūnanga is required to determine what protection is sufficient for addressing cultural impacts and whether the proposed objectives and attribute targets are suitable.

588. On this basis, I am unable to reach a conclusion on the:
- a. Appropriateness of the proposed cultural health Receiving Environment Objectives and Targets;
 - b. Absence of Receiving Environment Objectives or Targets for groundwater quality and quantity and springs;
 - c. Ngā Rūnanga's acceptance to undertake the cultural health monitoring with the Applicant; and
 - d. Agreement to the ongoing collaboration as specified proposed consent conditions.
589. In absence of this information and CIAs for all catchments, I am unable to conclude what the effects on cultural values will be, and I consider that this will need to be resolved at the hearing.
590. As noted in the 'Mahaanui Iwi Management Plan 2013 Section' below, the CSNDC supports some of the cultural policies but is possibly inconsistent with others. In absence of CIAs for all catchments, it is therefore not possible for me to conclude whether or not the proposal is consistent or inconsistent with, or even contrary to the above MIMP policies, specifically the policies around Ngā Rūnanga opposing 'global' resource consents and direct discharges to surface water bodies, and the cultural significance of rivers and coastal environment. These matters will need to be further considered throughout the hearing process.

Effects on Property, Persons and Organisations

Overview

591. Several submissions received identified potential adverse effects on property, persons and organisations. These included:
- a. Christchurch International Airport Limited (CIAL);
 - b. New Zealand Steel Limited (NZ Steel);
 - c. Lyttelton Port Company (LPC);
 - d. Styx Residents.

Christchurch International Airport Limited

592. CIAL in their submission expressed concern that the risk of bird strike has not been assessed in the application or the supporting documentation. CIAL considers that it is critical to ensure that any consent contain adequate controls to ensure that any new stormwater system or upgrading of the existing system is appropriately designed to minimise the risk of bird strike.
593. CIAL considers that within three kilometres of the airport, stormwater management systems should be designed so that:
- a. Infiltration basins drain completely within 48 hours of the cessation of a 2% AEP storm event;
 - b. Rapid soakage overflow chambers are sufficient in number and capacity to minimise any ponding outside of the infiltration basin area;

- c. The use of plant species in stormwater management systems is limited to those species that will not increase the attractiveness of the area for birds.
594. I consider that the matter of bird strike should be considered in the SMPs that are within three kilometres of the airport. I have recommended the Applicant's Proposed Condition 6 includes a requirement for SMPs to assess and minimise the risks individual stormwater treatment facilities have on the bird strike risk.

New Zealand Steel Limited

595. New Zealand Steel Limited (NZ Steel) has submitted on the CSNDC due to the potential implications for the use of their zinc/aluminium roofing and cladding products.
596. NZ Steel supports the over-arching objectives to reduce metal concentrations in waterways and coastal waters; however, it states that the conditions of the CSNDC as well as the SMPs must be workable in relation to the available products in the market place. There is concern that the SMP process could preclude the use of some products, which have been shown to release significantly less zinc than older products.
597. NZ Steel have also expressed that they wish to be involved in the development of SMPs and the Implementation Plan to ensure their technical knowledge is utilised, and that there are no unnecessary cost implications for clients or restrictions from products being used.

Lyttelton Port Company

598. Lyttelton Port Company (LPC) consider that the discharges of stormwater from the Port in CCC's network during and after repair and upgrade work should be provided for in Proposed Condition 1 of the CSNDC.
599. Concern are also raised about lack of clarity on how stormwater discharges associated with City Depot will be accepted into the City Council network.
600. LPC also requested that clarity is provided on when stormwater discharges from industrial sites are acceptable, as well as on what constitutes site development and site redevelopment.
601. As noted above, LPC also requests that the Whakaraupō/Lyttelton Harbour catchment should be separated from the wider Te Pātaka o Rākaihautū/Banks Peninsula SMP. A standalone SMP is recommended to be prepared for the Whakaraupō/Lyttelton Harbour settlements.

Styx Residents

602. The submissions from residents in the Pūharakekenui/Styx River catchment area have been addressed in the 'Effects on Surface Water Quantity' Section and in Mr Law's Section 42A report.

Positive Effects

603. The Applicant addressed positive effects of the proposal in Section 8.10 (Page 133) of the AEE and in the letter received on 9 July 2018.
604. In summary, the Applicant states that the CLM completed indicates that without stormwater mitigation measures across the city in both proposed and existing urban environments, the quality of the receiving environments will decline. The implementation of stormwater mitigation through the CSNDC and the net

reduction of contaminants entering the environment will give rise to positive effects primarily in the natural environment, such as improved health of surface waterways, the estuary and coastal environments, as well as reductions in sediments loads. This, in turn, will give rise to positive effects on cultural, amenity and recreation values for local residents. Further, it is considered that the management of stormwater under the CSNDC will reduce the flood risk in flood-prone areas.

605. I do not disagree with these statements. However, I note that it is uncertain at this stage as to how much improvements in discharge quality and reductions in contaminant loads can be achieved. However, through the development of SMPs and Implementation Plan, the Applicant will be required to identify alternative ways to manage and improve stormwater discharges, which have the potential to reduce the impacts of the stormwater discharges on the receiving environments. I also note that the Applicant has committed to work progressively towards achieving the Receiving Environment Objectives and Targets, which are consistent with the LWRP freshwater outcomes.
606. Notwithstanding this, I also recognise that the Applicant provides a functioning reticulated stormwater system that provides conveyance, treatment and discharge of stormwater from the majority of the Christchurch City and within Banks Peninsula settlements. The system also provides flood mitigation for wide parts of Christchurch City. The network has been operated by the Applicant for a long time, servicing established development throughout the District. The Applicant also maintains natural and artificial water bodies within Christchurch City. On this basis, while I cannot comment of the effects of the stormwater discharges on cultural values, I consider that the existing stormwater infrastructure has contributed significantly to general social and economic wellbeing.
607. Although no clear and robust approach has been provided yet on how stormwater from development sites and HAIL and industrial sites is managed, I consider that the recommendations above will enable to applicant to adequately manage stormwater discharges from such sites. I consider that the management of these sites, if done in accordance with a clear and robust process, will likely give rise to further positive effects on the receiving environment, which has on-flow effects on cultural, recreational and amenity values.
608. I also note that managing stormwater discharges throughout the Christchurch District under one comprehensive resource consent will enable the Applicant more efficient management of stormwater in an integrated manner.

Summary of Assessment of Effects

Overview

609. This section provides:
- a. A summary of the assessments of effects and comments on whether or not the Applicant's proposal is considered adequate to avoid, remedy or mitigate adverse effects; and
 - b. Recommended changes required to achieve the necessary criteria for approving the adaptive management approach.

Management of Construction-phase Stormwater Discharges

- 610. The ESC approach is one of the key parts of an adaptive management approach to stormwater management. However, a clear and robust process for managing construction-phase stormwater discharges under the CSNDC has not been provided. I recommend that an approach be developed by the Applicant to demonstrate adverse effects of the sediment discharges can be adequately avoided, remedied or mitigated. An independent auditing process is also recommended to review general compliance with the approach to managing sediment discharges from construction sites.
- 611. A process needs to be developed between CCC and CRC to determine delegation of enforcement powers and how enforcement actions can be implemented for discharges from individual sites.
- 612. I recommend the inclusion of a TSS limit on the resource consent to enable CRC Compliance staff to more easily monitor the resource consent conditions and assist CCC with this process.
- 613. Overall, provided the above recommendations are adopted by the Applicant, I consider that the approach to ESC would provide for adequate management of construction-phase stormwater discharges under the CSNDC (if granted).

Management of Operational Stormwater Discharges from High-risk Sites

- 614. The existing MOU process would generally be suitable to address stormwater discharges from HAIL sites until 2025.
- 615. The general intent with the proposed approach to stormwater management could have beneficial outcomes and result in the overall improvement of quality of stormwater discharges to the receiving environments. However, a process for managing operational stormwater discharges from high-risk HAIL and industrial sites under the CSNDC has not been provided in the application. It is therefore recommended that a clear and robust process/strategy be developed by the Applicant (in collaboration with CRC) to demonstrate adverse effects of the stormwater discharges from such sites can be adequately managed. An independent auditing process is also recommended to review general compliance with the approach to managing stormwater discharges from high-risk sites.
- 616. Overall, I consider that the risk that stormwater discharges from high-risk HAIL and industrial sites pose on water quality can be adequately managed provided a clear and robust process is in place.

Management of Effects on Soil Quality

- 617. The potential adverse effects on soil quality and subsequent impacts on human and ecological health can be adequately managed through monitoring and follow-up maintenance actions.
- 618. Concerns have been raised about the lack of detail about monitoring and maintenance of infiltration devices. Further details are required on how contaminant build up in all facilities will be addressed.
- 619. Provided the recommendations are adopted by the Applicant, and more certainty is provided in the resource consent conditions around the maintenance processes for infiltration devices, I am of the opinion that the potential adverse effects of the stormwater discharges on soil quality will be adequately managed.

Management of Effects on Groundwater Quality

- 620. The proposed groundwater quality Receiving Environment Objectives and Targets are considered appropriate. An additional Attribute Target Level for Cadmium is recommended.
- 621. It is recommended that any increase in the concentration of *E. coli* in groundwater should be investigated through the proposed Responses to Monitoring procedure detailed in the proposed conditions.
- 622. The current conditions do not provide for adequate measures to manage the risk from stormwater discharges from HAIL and high-risk industrial sites to groundwater quality in the city water supply aquifers and spring-fed streams. More comprehensive provisions are recommended that would provide more reassurance that the risk of spillages and discharges from HAIL sites included in the scope if the CSNDC is adequately controlled post 2025.
- 623. Based on the expert advice received, I recommend that resource consent conditions be included to specify appropriate separation distances between infiltration basins and landfills or other contaminated land where contamination could potentially be mobilised by groundwater mounding.
- 624. The proposed separation distances between new infiltration facilities and domestic supply bores are not considered adequate, and an increase in distance is recommended. The same separation distances are also recommended for community supply bores.
- 625. Overall, I consider that the potential adverse effects of the stormwater discharges on groundwater quality will be no more than minor and less than minor on groundwater users provided the recommended changes to the proposal are adopted by the Applicant, and the required additional information is provided at the hearing.

Management of Effects on Groundwater Quantity

- 626. No specific Receiving Environment Objectives and Targets for groundwater quantity are required.
- 627. The potential adverse effects of the proposal on groundwater quantity are likely to be minor provided the SMP for each catchment includes an appropriate assessment of effects and suitable mitigation measures where appropriate. To achieve this, amendments to the Applicant's proposed conditions are recommended to include assessments of the direct local groundwater mounding effects on flows in local watercourses and the cumulative effects on groundwater levels and stream baseflows.

Management of Effects on Surface Water Quantity

- 628. The review of the flood modelling provided with the application raises concerns around the number of monitoring sites in each catchment, the use of a single event to measure network performance, the allowable increase in water levels and the baseline years, the re-assessment interval for flood modelling and the performance measurement in non-modelled catchments. Corresponding changes to the flood modelling approach are recommended to ensure that the flood risk is not exacerbated as a result of the stormwater discharges.
- 629. Retrofitting existing developments with water quantity mitigation, where practicable, is considered to aid in reducing flooding effects.
- 630. Changes to the wording of Proposed Condition 22 are recommended to ensure clarity about what actions the Applicant will be required to take to meet the

objectives and targets specified under Schedule 7 of the proposed conditions. Further, it is recommended that Schedule 7 of the proposed conditions includes a Receiving Environment Objective for managing peak flows not to cause or exacerbate the risk of inundation, erosion or damage to property or infrastructure downstream or risks to human safety.

631. A sufficiently detailed assessment of effect of the interception and diversion of rainfall on groundwater levels and stream base flows is recommended to be included in the SMPs to ensure that any such effects are appropriately managed and mitigated.
632. A resource consent condition was proposed by the Applicant requiring that mitigation facilities are to be designed and constructed in accordance with recognised and approved design standards. This will ensure that potential adverse effects of erosion and scour as a result of the stormwater network discharges are likely to be adequately managed.
633. Overall, I consider that the adverse water quantity effects of the stormwater discharges will be no more than minor provided the recommendations made above are adopted by the Applicant.

Management of Effects on Freshwater Quality and Aquatic Ecology

634. The Objectives and Target Levels for waterways are well aligned with the LWRP outcomes and standards. Commitment to improve the receiving environments has been demonstrated through the proposed consent conditions. The overall approach proposed by the Applicant is likely to result in an overall improvement in the receiving waterways.
635. However, the following concerns are raised:
- a. There is insufficient spatial detail within the application and too much uncertainty around the CLM approach. Questions are raised about the suitability of the CLM approach for the CSNDC, and about the appropriateness of using the C-CLM into the future. Recommendations are made to address the areas of concern.
 - b. A more frequent, five-yearly review of the SMPs is recommended to respond monitoring, the proposed investigations programme and policy changes.
 - c. There is a lack of certainty around implementation and efficacy of mitigation measures and thus uncertainty around when outcomes might be achieved.
 - d. There is a lack of a review mechanism to account for future policy changes to stormwater and urban waterway management.
636. Overall, if more clarity around the reduction targets in the C-CLM and more certainty around implementation and efficacy of mitigation measures is provided (particularly around the management of stormwater discharges from development and high-risk sites), and the other recommendations are adopted by the Applicant, I consider that the proposal will provide an approach that aims at meeting the Receiving Environment Objectives and Targets. A clear commitment to work towards meeting the objectives and targets would also demonstrate consistency with LWRP Policy 4.16.

Management of Effects on Coastal Water Quality and Aquatic Ecology

637. Overall, the effects of the stormwater discharges on the receiving coastal environment are able to be adequately mitigated, provided the targets in

Schedule 5 of the proposed conditions are amended to include a requirement for a decrease in TSS and dissolved metals concentrations

638. The general intent of the CSNDC to improve discharge quality and retrofit existing freshwater catchments, where practicable, is likely to contribute to improvements in water quality in the coastal and estuarine receiving environments. However, the degree of improvements is dependent on the management of construction-phase stormwater discharges and discharges from high-risk sites under the CSNDC (if granted), and also on more certainty relating to a reduction of contaminant loads for the catchments contributing to coastal water and estuaries.

Management of Effects on Amenity and Recreational Values

639. A faecal coliform target is not required due to the major sources of faecal coliforms not being stormwater driven. However, ongoing monitoring of *E. coli* is recommended.
640. Education of dog owners should be considered as part of any community education around stormwater that is rolled out.
641. The faecal indicator bacterium enterococci should be used to assess coastal water quality for contact recreation in sea water is considers appropriate.
642. It is recommended that Table 3 of the proposed EMP is updated to include the faecal coliforms as a parameter and the MfE/MoH (2003) guidelines for water over-lying shellfish be in the coastal guideline level. Warning signage should be erected in areas identified as not meeting guideline values.
643. New stormwater treatment facilities proposed under the CSNDC may reduce microbial contaminant concentrations in the discharge; however, there is likely to be an ongoing contribution to faecal contamination from waterfowl in stormwater facilities.

Management of Effects on Cultural Values

644. It is understood that Ngā Rūnanga and CCC have reached an agreement regarding the CSNDC.
645. In absence of comments from Ngā Rūnanga on the appropriateness of the proposed cultural health and other Receiving Environment Objectives and Targets, acceptance to undertake the cultural health monitoring with the Applicant and CIAs for all catchments, I am unable to conclude what the effects on cultural values will be, and I consider that this important matter will need to be resolved at the hearing.

ADDITIONAL MITIGATION MEASURES

646. As discussed in the AEE Section above, I consider that amendments and additions are required to the proposed resource consent conditions.

CONSIDERATION OF ALTERNATIVES

647. Section 104(3) of the RMA requires a consideration of alternatives for applications for a discharge permit.
648. The Applicant has considered alternative discharge methods for stormwater from the CSNDC area as follows:

- a. Maintain the status quo;
 - b. Discharge to ground;
 - c. Discharge to water; and
 - d. Discharge to both ground and water.
649. The Applicant states that when selecting appropriate stormwater treatment options will include compliance, cost, technical feasibility and environmental and economically acceptability. In summary, for each SMP area, the proposed mitigation option is chosen to be the most cost-effective outcome that also achieves the desired receiving environment objectives.
650. I also note the vast majority of the discharges from the network is a necessity, and existing stormwater infrastructure throughout the district is established and has been for quite some time. I also note that the Applicant will be required to look into identifying alternative ways to manage stormwater through the SMP and Implementation Plan development, but there is little to no alternatives as for where the stormwater is discharged. exceptional circumstances may exist due to the necessity of the stormwater infrastructure to discharge.

COMPLIANCE HISTORY

651. I have reviewed the Applicant's compliance history for the current stormwater network discharge consents. A brief summary is provided below:
- a. CRC090292 – Interim Global:
 - i. Non-compliances with conditions requiring industrial audits;
 - ii. Wet weather monitoring was not provided as required; and
 - iii. Issues were noted with erosion and sediment control measures not being in place at construction sites and tracking of sediment from construction sites onto roads from where it gets washed into the stormwater network.
 - b. CRC120223 – South West Global:
 - i. Compliance issues are noted with sediment discharges from construction sites;
 - ii. Development sites operating under the 'global' resource consent exceeding the maximum allowed site area; and
 - iii. CCC not having completed the required industrial site audits. Audits were completed but were trade waste related not specifically stormwater.
 - c. CRC131249 – Styx Global:
 - i. Non-compliance with the industrial site audits, and the implementation plan was also not provided; and
 - ii. The annual report was not complete in consultation with Rūnanga, and enhancement programmes and future funding were discussed.
652. I understand that one of the complicating factors that hinders the CRC Compliance staff's ability to effectively monitor these resource consents is the inconsistency in the reporting timeframe and that the information is not all submitted consent holder at the same time (e.g. Annual Report and Surface

Water Report submitted several months apart). It is understood that this makes it difficult to effectively monitor the resource consent conditions. I therefore recommend changes to the Applicant's proposed conditions to provide for consistent reporting timeframes.

OBJECTIVES AND POLICIES

Overview

653. Section 104(1)(b) of the RMA requires the consent authority, subject to Part 2 of the RMA, to have regard to any provisions (objectives and policies) relevant to an application for resource consents. With regard to the CSNDC, I have had regard to the provisions of:

- a. The National Policy Statement for Freshwater Management 2014 (NPS-FM);
- b. The New Zealand Coastal Policy Statement (NZCPS);
- c. The National Environment Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NES-CS);
- d. The National Environment Standard for Sources of Drinking Water (NES-DW);
- e. The Canterbury Regional Policy Statement 2013 (CRPS);
- f. The Canterbury Land & Water Regional Plan (LWRP);
- g. The Waimakariri River Regional Plan (WRRP);
- h. The Regional Coastal Environment Plan (RCEP);
- i. The Lyttelton Port Recovery Plan (LPRP); and
- j. The Christchurch District Plan (CDP).

654. As the Applicant amended the proposal, which resulted in the requirement for a new application, I have only had regard to the relevant objectives and policies that are operative or proposed currently.

National Policy Statement for Freshwater Management 2014

655. Section 104(1)(b)(iii) of the RMA states that the consent authority must have regard to the relevant provisions of a National Policy Statement.

656. The National Policy Statement for Freshwater Management 2014 (NPS-FM) sets out the objectives and policies for freshwater management and provides direction on how local authorities should manage freshwater. The NPS-FM seeks that activities that affect freshwater are managed in an integrated and sustainable way, while providing for economic growth within set water quantity and quality limits. The main aim of the NPS-FM is to at least maintain freshwater quality and quantity, and to improve freshwater quality and quantity where it is degraded. The NPS-FM was last amended in September 2017.

657. I consider the following Objectives and Policies of the NPS-FM (2017) relevant to the proposal. I also understand that MfE is currently working on further changes to the NPS-FM; however, it is not known when these will be notified.

Te Mana o te Wai

658. **Objective AA1** of the NPS-FM states:

To consider and recognise Te Mana o te Wai in the management of fresh water.

659. **Policy AA1** of the NPS-FM gives effect to this objective stating:

By every regional council making or changing regional policy statements and plans to consider and recognise Te Mana o te Wai, noting that:

- (a) Te Mana o te Wai recognises the connection between water and the broader environment – Te Hauora o te Taiao (the health of the environment), Te Hauora o te Wai (the health of the waterbody) and Te Hauora o te Tangata (the health of the people); and*
- (b) Values identified through engagement and discussion with the community, including tangata whenua, must inform the setting of freshwater objectives and limits.*

660. The current LWRP and WRRP frameworks were developed prior to this new objective and policy for Te Mana o te Wai, (which were inserted as part of the 2017 amendments to the NPS-FM). However, the plans do provide for the health of the environment, freshwater and people, incorporating values of tangata whenua and the wider community.

661. The Applicant has consulted with Ngā Rūnanga and it is understood that an agreement has been reached regarding the proposed conditions and the submission made by the Ngāi Tahu parties on the original application CRC160056, and that Ngā Rūnanga is comfortable with the proposed stormwater management approach. However, the agreement has not been provided to CRC, and I also note that no submission was received from Ngā Rūnanga. In absence of this or any further comment from Ngā Rūnanga on the proposal, I am unable to conclude whether the proposal provides consistency with the above Objective and Policy, and this should be addressed at the hearing.

Water Quality

662. **Objective A1** of the NPS-FM states:

To safeguard:

- (a) The life-supporting capacity, ecosystem processes and indigenous species including their associated ecosystems, of fresh water; and*
- (b) The health of people and communities, as affected by contact with fresh water;*

In sustainably managing the use and development of land, and of discharges of contaminants.

663. **Objective A2** of the NPS-FM states:

The overall quality of fresh water within a freshwater management unit is maintained or improved while:

- (a) Protecting the significant values of outstanding freshwater bodies;*
- (b) Protecting the significant values of wetlands; and*
- (c) Improving the quality of fresh water in water bodies that have been degraded by human activities to the point of being over-allocated.*

664. **Objective A3** of the NPS-FM states:

The quality of fresh water within a freshwater management unit is improved so it is suitable for primary contact more often, unless:

- (a) Regional targets established under Policy A6(b) have been achieved; or*
- (b) Naturally occurring processes mean further improvement is not possible.*

665. **Objective A4** of the NPS-FM states:

To enable communities to provide for their economic well-being, including productive economic opportunities, in sustainably managing freshwater quality, within limits.

666. Policy A1 of the NPS-FM states:

By every regional council making or changing regional plans to the extent needed to ensure the plans:

- (a) Establish freshwater objectives in accordance with Policies CA1-CA4 and set freshwater quality limits for all freshwater management units in their regions to give effect to the objectives in this national policy statement, having regard to at least the following:*
 - (i) The reasonably foreseeable impacts of climate change;*
 - (ii) The connection between water bodies; and*
 - (iii) The connections between freshwater bodies and coastal water; and*
- (b) Establish methods (including rules) to avoid over-allocation.*

667. Policy A2 of the NPS-FM states:

Where freshwater management units do not meet the freshwater objectives made pursuant to Policy A1, every regional council is to specify targets and implement methods (either or both regulatory and non-regulatory), in a way that considers the sources of relevant contaminants recorded under Policy CC1, to assist the improvement of water quality in the freshwater management units, to meet those targets, and within a defined timeframe.

668. Policy A3 of the NPS-FM states:

By regional councils:

- (a) Imposing conditions on discharge permits to ensure the limits and targets specified pursuant to Policy A1 and Policy A2 can be met; and*
- (b) Where permissible, making rules requiring the adoption of the best practicable option to prevent or minimise any actual or likely adverse effect on the environment of any discharge of a contaminant into fresh water, or onto or into land in circumstances that may result in that contaminant (or, as a result of any natural process from the discharge of that contaminant, any other contaminant) entering fresh water.*

669. Policy A4 of the NPS-FM requires regional councils to amend regional plans (without using the process in Schedule 1) to the extent needed to ensure the plans include the policy wording included in Policy A4 to apply until any changes under Schedule 1 to give effect to Policy A1 and Policy A2 (freshwater quality limits and targets) have become operative. The policy wording has been included in the LWRP under Policy 4.8A.

670. Policy A5 of the NPS-FM states:

By every regional council making or changing regional plans to the extent needed to ensure the plans:

- (a) Identify specified rivers and lakes, and primary contact sites; and*
- (b) State what improvements will be made, and over what timeframes, to specified rivers and lakes, and primary contact sites, so they are suitable for primary contact more often; or*
- (c) State how specified rivers and lakes, and primary contact sites, will be maintained if regional targets established under Policy A6(b) have been achieved.*

Improvements to specified rivers and lakes in (b) must make a contribution to achieving regional targets established under Policy A6(b).

671. Policy A6 of the NPS-FM states:

By every regional council developing regional targets to improve the quality of fresh water in specified rivers and lakes and contribute to achieving the national target in Appendix 6, and ensuring:

(a) Draft regional targets are available to the public by 31 March 2018; and

(b) Final regional targets are available to the public by 31 December 2018.

672. **Policy A7** of the NPS-FM states:

By every regional council considering, when giving effect to this national policy statement, how to enable communities to provide for their economic well-being, including productive economic opportunities, while managing within limits.

673. The regional plans are required to give effect to the NPS-FM; however, all regional plans relevant to the proposal were drafted prior to the 2014 or 2017 versions of the NPS-FM being released.

674. The LWRP, which applies to the majority of the sub-catchments, was originally drafted to give effect to the 2011 version of the NPS-FM. However, it has since been amended to include the 2014 national policy changes. Subsequent plan changes to the LWRP were developed to give effect to the 2014 version of the NPS-FM. Notably, this includes Plan Change 4, which included new/amended stormwater provisions in the LWRP.²³ The LWRP does include water quality outcomes in Table 1a for Canterbury Rivers, and with Policies 4.1 to 4.6 of the LWRP it provides numeric and narrative objectives for waterways. While a Progressive Implementation Plan has been developed to give effect to the NPS-FM, setting catchment specific outcomes and limits has not yet occurred for Christchurch–West Melton Zone. However, the overall intent of the LWRP is consistent with the objectives and Policies of NPS-FM in that it seeks to maintain and/or improve (where degraded) freshwater quality and quantity. The WRRP objectives, policies and standards for water quality provide for recreation in certain areas, and Appendix 3 of the WRRP identifies values for rivers, including swimming.

675. The Applicant proposes to progressively improve the discharge quality, which was modelled to lead to reductions in contaminant loads throughout the modelled catchments. However, it is unclear from the C-CLM whether improvements are achieved in all receiving catchments (freshwater management units), and therefore consistency with the 2017 NPS-FM Objective A2 cannot ultimately be determined at this stage. However, the resource consent conditions proposed by the Applicant require investigations and additional targeted mitigation where possible if improvements on a catchment scale do not occur. Although stormwater discharges are not the only source of contamination within the urban waterways, I consider the proposed approach to the management of stormwater will assist in the improvement of urban water quality in Christchurch.

676. The NPS-FM specifies that a regional plan needs to outline limits or targets and a timeframe for meeting these where water quality does not meet freshwater outcomes. The LWRP sets outcomes and limits and a timeframe for meeting it.

677. The Applicant has proposed Receiving Environment Objectives and Targets (Schedules 4 to 7 of the proposed resource consent conditions) to work towards achieving the LWRP water quality outcomes, but no timeframe for doing so. Further, as discussed above, there are currently uncertainties around the commitment shown by the applicant to progressively work towards these outcomes being achieved by.

²³ Including Policies 4.15, Policy 4.16A and Rules 5.93, 5.94A-5.94C, 5.95A, 5.95, 5.96 and 5.97.

678. In my opinion, Policy 4.16(e) of the LWRP can be interpreted in a way that that the CCC is required, as soon as practicable, but not later than 2025, to demonstrate a commitment to progressively improve the quality of the stormwater discharge to meet the specified water quality outcomes. In my view, working towards progressively improving the quality of the discharge to meet specified water quality outcomes in the future (i.e. post 2025) is consistent with the NPS-FM policy framework. To achieve this, sufficient clarity needs to be provided around the Applicant's intent to improve the stormwater discharge quality, the proposed measurement of water quality via monitoring against the targets in the form of CLM (demonstrating improvements) and Schedules 4 to 6 of the proposed conditions, flood modelling (demonstrating no exacerbation of flooding effects), cultural health monitoring and other mechanisms and responses to the modelling and monitoring that underline the Applicant's commitment towards the outcomes. Currently, the proposal does not provide sufficient certainty that these outcomes will be achieved, and therefore I consider the proposal is inconsistent with this policy, which is discussed further below.
679. I also note that Policy A3(b) of the NPS-FM requires councils to make "*rules requiring the adoption of the best practicable option to prevent or minimise any actual or likely adverse effect on the environment of any discharge of a contaminant*". As discussed above, the phrase 'reasonable endeavours' as proposed by the Applicant throughout the proposed conditions does not provide sufficient clarity. On this basis, I consider that the NPS-FM requires more emphasis on certainty of mitigation measures, which supports the recommendation for changes to the conditions to achieve greater certainty.
680. With regard to the 2017 NPS-FM Objective A4 and new Policy A7, I consider that the LWRP gives effect to the requirement that the community's economic wellbeing is provided for while sustainably managing freshwater to (quality and quantity) outcomes, standards and limits.
681. Overall, I consider that, subject to adopting the recommended changes to the proposed conditions, the objectives and targets set in Schedule 4 of the proposed consent conditions and the adaptive management methodology proposed will ensure that the life-supporting capacity of ecosystems and health of the Christchurch community is protected and improved in those degraded waterbodies. However, without adopting the recommended changes, there is considerable uncertainty as to the commitment to, and timeframe of, the implementation of mitigation measures.

Integrated Management

682. **Objective C1** of the NPS-FM states:

To improve integrated management of fresh water and the use and development of land in whole catchments, including the interactions between fresh water, land, associated ecosystems and the coastal environment.

683. **Policy C1** of the NPS-FM gives effect to this objective, stating:

By every regional council:

- (a) *Recognising the interactions, ki uta ki tai (from the mountains to the sea) between fresh water, land, associated ecosystems and the coastal environment; and*
- (b) *Managing fresh water, land use, and development in catchments in an integrated and sustainable way to avoid, remedy or mitigate adverse effects, including cumulative effects.*

684. While the LWRP was developed prior to the 2017 amendments to Policy C1, I consider that it gives effect to this policy as the amendments only sought to explicitly introduce the principle of ki uta ki tai (in Policy C1(a)), which has already been recognised throughout the LWRP.
685. The Applicant has assessed this objective and states that the proposed management of stormwater in the CSNDC area is consistent with the approach required under Objective C1. I agree that the proposed approach will likely improve the integrated management of stormwater across the Christchurch District, therefore providing consistency with this Objective. I do, however, consider that the fact that some sites are still excluded beyond 2025 limits the extent of this integration to some degree.

National Objectives Framework

686. **Objective CA1** of the NPS-FM states:
- To provide an approach to establish freshwater objectives for national values, and any other values, that:*
- (a) *Is nationally consistent; and*
- (b) *Recognises regional and local circumstances.*
687. **Policy CA1** of the NPS-FM gives effect to this objective, stating:
- By every regional council identifying freshwater management units that include all freshwater bodies within its region.*
688. **Policy CA2** of the NPS-FM requires regional councils to develop freshwater objectives in discussion with communities including tāngata whenua.
689. The majority of the LWRP was developed prior to the National Objectives Framework, and with regard to the proposal, not all specific sub-regional outcomes and limits have been set in accordance with the National Objectives Framework (this is due to the Council's Progressive Implementation Programme, which is explicitly allowed for under the NPS-FM). As discussed above, the overall intent of the LWRP is consistent with the objectives and Policies of NPS-FM.
690. With regard to the Applicant's proposal, I consider that the proposal currently does not meet the above Policy CA2. However, if a review condition is included on the resource consent that allows CRC to review the discharge permit within five years of the Christchurch–West Melton sub-regional section being notified (discussed further below), then consistency with the above Objective and Policies can be ensured.

Monitoring Plans

691. **Objective CB1** of the NPS-FM states:
- To provide for an approach to the monitoring of progress towards, and the achievement of, freshwater objectives and the values identified under Policy CA2(b).*
692. Policies CB1 to CB4 of the NPS-FM give effect to this objective by requiring the Council to develop monitoring plans and methods or action plans.
693. Neither the LWRP nor the WRRP give effect to the 2017 monitoring requirements. While monitoring plans are a mandatory requirement under the NPS-FM, they do not need to form part of a regional plan or otherwise be provided for in the provisions of a regional plan. To this extent, the LWRP and WRRP are not directly relevant to Part CB of the NPS-FM.

694. The Applicant has developed an EMP, which may assist with the CRC's monitoring obligations under the NPS-FM.

Tangata Whenua Roles and Interests

695. **Objective D1** of the NPS-FM states:

To provide for the involvement of iwi and hapū, and to ensure that tāngata whenua values and interests are identified and reflected in the management of fresh water including associated ecosystems, and decision-making regarding freshwater planning, including on how all other objectives of this national policy statement are given effect to.

696. **Policy D1** of the NPS-FM states:

Local authorities shall take reasonable steps to:

- (a) Involve iwi and hapū in the management of fresh water and freshwater ecosystems in the region;*
- (b) Work with iwi and hapū to identify tāngata whenua values and interests in fresh water and freshwater ecosystems in the region; and*
- (c) Reflect tāngata whenua values and interests in the management of, and decision-making regarding, fresh water and freshwater ecosystems in the region.*

697. The objectives and policies of the LWRP take into account Tāngata Whenua values, and therefore the plan gives effect to the above NPS-FM objective and policy.

698. The Applicant states that Tāngata Whenua values have been taken into account when developing the proposed management approach to stormwater via engagement undertaken as well as the consideration of the relevant iwi management plans. The Applicant also states that they are committed to an on-going partnership with the local Papatipu Rūnanga, which is reflected in the proposed conditions.

699. I consider that the Applicant has provided for Rūnanga involvement in requesting Cultural Impact Assessments and obtaining advice about the CSNDC approach. The proposed conditions also provide for on-going involvement with the Papatipu Rūnanga during multiple stages of the development of SMPs. Further, proposed Condition 15 in particular requires engagement with Papatipu Rūnanga.

700. The Cultural Impact Assessments that have been undertaken or will be undertaken identify cultural interests in the receiving environment. The Receiving Environment Objectives and Targets and the cultural health monitoring reflect the intention of managing impacts on cultural values; however, these have not been confirmed as acceptable by Ngā Rūnanga. As noted above, Ngā Rūnanga has not submitted on the amended proposal but a letter of non-opposition has been provided.

701. I consider that the proposal can be seen as largely consistent with the above objective and policy, provided confirmation from Ngā Rūnanga is provided. However, in absence of this, I am unable to reach a conclusion on whether the proposal accurately reflects tāngata whenua values and interests, and therefore whether the proposal is consistent with the above Tangata Whenua Objective and Policy.

Progressive Implementation Programme

702. Policy E1 of the NPS-FM regional councils to implement the policies of the NPS-FM as promptly as is reasonable but no later than 2025. The policy states:

- (c) *Where a regional council is satisfied that it is impracticable for it to complete implementation of a policy fully by 31 December 2015, the council may implement it by a programme of defined time-limited stages by which it is to be fully implemented by 31 December 2025 or 31 December 2030 if Policy E1(ba) applies.*
703. The CRC has developed and implemented the Progressive Implementation Programme (PIP) in 2015, which outlines the staged approach to implementing the NPS-FM policies in all sub-regional sections of the LWRP. For the Christchurch–West Melton Zone, the implementation of a sub-regional policy framework has been scheduled for 2020/2021. The scope and content of the sub-regional chapter is currently unknown.
704. I note that the development of the Christchurch West Melton sub-regional plan change has been delayed from the original date stated in CRC's PIP (2015). The CRC's Long Term Plan 2028 – 2038, which was adopted by the Council in June 2018, has set a target date of 2022 for the notification of the Christchurch West Melton sub-regional plan change.
705. Further, as discussed in more detail in the 'Land and Water Regional Plan' Section below, I also note that the proposed Plan Change 5 to the LWRP (PC5) seeks to limit resource consent durations for catchments where no PIP has been developed to ensure discharges are consistent with sub-regional chapter.
706. As discussed in the 'Duration' Section below, the Hearing Commissioners will need to determine the merits of the CSNDC proposal against the development of the sub-regional policy framework in consultation with the community and Tāngata Whenua.

Summary

707. The LWRP in its current version gives effect to the NPS-FM insofar as it is required to. The PIP will ensure that the relevant NPS-FM policies are implemented by 2025 (or 2030) and this will include the development of the sub-regional policies and freshwater outcomes and limits to be developed for the Christchurch–West Melton Zone.
708. Overall, I consider that while the proposal is inconsistent with some of NPS-FM policies, it is not contrary to its provisions overall.

New Zealand Coastal Policy Statement

709. The New Zealand Coastal Policy Statement (NZCPS) states policies to achieve the purpose of the RMA in relation to the coastal environment of New Zealand. A consent authority must have regard to its provisions when considering a resource consent application. I have commented on the Applicant's assessment and discussed the relevant objectives and policies below.
710. Objective 1 of the NZCPS states:
- To safeguard the integrity, form, functioning and resilience of the coastal environment and sustain its ecosystems, including marine and intertidal areas, estuaries, dunes and land, by: [...]*
- *Maintaining coastal water quality, and enhancing it where it has deteriorated from what would otherwise be its natural condition, with significant adverse effects on ecology and habitat, because of discharges associated with human activity.*
711. The Applicant is proposing to maintain and where possible improve the current coastal water quality. Dr Bolton-Ritchie states that little is known about the current impacts of stormwater discharges in the Christchurch coastal

environment. Because of this I consider that it is difficult to determine whether it is appropriate to maintain current coastal quality as areas may have been significantly impacted by discharges from urban areas. Nonetheless, I consider that the proposal seeks to improve freshwater quality, and the improvements in water quality from rivers will have a positive influence in the Ihutai/Avon-Heathcote Estuary.

712. Policy 1(1) of the NZCPS states:

Recognise that the extent and characteristics of the coastal environment vary from region to region and locality to locality; and the issues that arise may have different effects in different localities.

713. Due to the varying coastal environments that receive stormwater discharges, and the limited information currently available on the actual effects of stormwater discharges on coastal water, the Applicant seeks to reduce sediment input to prevent adverse effects on water clarity and aquatic biota, reduce the heavy metal concentrations in the discharges and to enhance mana whenua coastal values. Limits are proposed for heavy metals and no statistically significant increase in TSS concentrations is sought. The Applicant proposes to develop SMP for the Ihutai/Estuary and coastal environment, and the CSNDC provides the framework under which discharge quality is proposed to be improved over time. Monitoring is required to gauge ongoing water quality in the estuarine and coastal catchment.

714. Policy 11 of the NZCPS states:

To protect indigenous biological diversity in the coastal environment:

(a) *Avoid adverse effects of activities on:*

- (i) *Indigenous taxa that are listed as threatened or at risk in the New Zealand Threat Classification System lists;*
- (ii) *Taxa that are listed by the International Union for Conservation of Nature and Natural Resources as threatened;*
- (iii) *Indigenous ecosystems and vegetation types that are threatened in the coastal environment, or are naturally rare;*
- (iv) *Habitats of indigenous species where the species are at the limit of their natural range, or are naturally rare;*
- (v) *Areas containing nationally significant examples of indigenous community types; and*
- (vi) *Areas set aside for full or partial protection of indigenous biological diversity under other legislation; and*

(b) *Avoid significant adverse effects and avoid, remedy or mitigate other adverse effects of activities on:*

- (i) *Areas of predominantly indigenous vegetation in the coastal environment;*
- (ii) *Habitats in the coastal environment that are important during the vulnerable life stages of indigenous species;*
- (iii) *Indigenous ecosystems and habitats that are only found in the coastal environment and are particularly vulnerable to modification, including estuaries, lagoons, coastal wetlands, dunelands, intertidal zones, rocky reef systems, eelgrass and saltmarsh;*
- (iv) *Habitats of indigenous species in the coastal environment that are important for recreational, commercial, traditional or cultural purposes;*
- (v) *Habitats, including areas and routes, important to migratory species; and*
- (vi) *Ecological corridors, and areas important for linking or maintaining biological values identified under this policy.*

715. Dr Bolton-Ritchie states that no specific work has been undertaken to assess the impacts of the CCC's stormwater discharges on coastal receiving environments. However, she considers the attributes to be assessed for coastal water (i.e. TSS concentrations and dissolved copper, lead and zinc concentrations) to be appropriate for the receiving environment objectives for coastal waters. Annual assessment of water quality data against the guideline values and assessment of temporal trends in parameter concentrations will allow for the assessment towards achieving the receiving environment Objectives. Dr Bolton-Ritchie also considers that impacts on coastal water quality and indigenous species are linked to the water quality of river water and stormwater inputs.
716. I consider that improvements in the discharge quality and the anticipated overall improvements in water quality of the district's rivers will have a positive influence on the water quality and ecology in both the Ihutai/Avon-Heathcote Estuary and the coastal environment. However, as discussed above, without adopting the recommended changes there is considerable uncertainty as to the commitment to, and timeframe of, the implementation of mitigation measures.
717. Policy 21 of the NZCPS states:
- Where the quality of water in the coastal environment has deteriorated so that it is having a significant adverse effect on ecosystems, natural habitats, or water based recreational activities, or is restricting existing uses, such as aquaculture, shellfish gathering, and cultural activities, give priority to improving that quality by:*
- (a) Identifying such areas of coastal water and water bodies and including them in plans;*
 - (b) Including provisions in plans to address improving water quality in the areas identified above;*
 - (c) Where practicable, restoring water quality to at least a state that can support such activities and ecosystems and natural habitats;*
 - (d) Requiring that stock are excluded from the coastal marine area, adjoining intertidal areas and other water bodies and riparian margins in the coastal environment, within a prescribed time frame; and*
 - (e) Engaging with tangata whenua to identify areas of coastal waters where they have particular interest, for example in cultural sites, wāhi tapu, other taonga, and values such as mauri, and remedying, or, where remediation is not practicable, mitigating adverse effects on these areas and values.*
718. As discussed above, there is little information known about the impacts of stormwater discharges in the coastal environment. The proposal to at least maintain coastal water quality, and the improvements sought for the discharge quality should result in a reduction of stormwater contaminants entering the Ihutai/Avon-Heathcote Estuary, and therefore prevent further degradation and stress to this and other coastal ecosystems.
719. Policy 22 of the NZCPS states:
- (1) Assess and monitor sedimentation levels and impacts on the coastal environment.*
 - (2) Require that subdivision, use, or development will not result in a significant increase in sedimentation in the coastal marine area, or other coastal water.*
 - (3) Control the impacts of vegetation removal on sedimentation including the impacts of harvesting plantation forestry.*
 - (4) Reduce sediment loadings in runoff and in stormwater systems through controls on land use activities.*
720. Sedimentation is a key issue in the Ihutai/Avon-Heathcote Estuary, Lyttelton Harbour and Akaroa Harbour. The Applicant is proposing to monitor TSS in

these environments and to reduce sediment inputs. Installing new stormwater treatment mitigation and improving water quality entering waterways should also have positive influences reducing sediment loads entering the coastal environment. On this basis I consider that the proposal is consistent with this policy. I also note that sediment sources are also not only from the stormwater network (e.g. rural roading, rural land and erosion on hill slopes), and these other sources are managed separately.

721. Policy 23(4) of the NZCPS states:

In managing discharges of stormwater take steps to avoid adverse effects of stormwater discharge to water in the coastal environment, on a catchment by catchment basis, by:

- (a) Avoiding where practicable and otherwise remedying cross contamination of sewage and stormwater systems;*
- (b) Reducing contaminant and sediment loadings in stormwater at source, through contaminant treatment and by controls on land use activities;*
- (c) Promoting integrated management of catchments and stormwater networks; and*
- (d) Promoting design options that reduce flows to stormwater reticulation systems at source.*

722. The Applicant states that there is separation of the stormwater and wastewater network and through the implementation of the SMPs, stormwater treatment devices will control sediment loads and provide the potential to improve water quality. I also note the mitigation adopted may include source controls and education to reduce contaminants entering discharges. While I consider that the proposal is generally consistent with this policy, I note that the Applicant will also be required to continue to repair and upgrade, where necessary, the reticulated wastewater network to reduce over time wet weather overflows into the CCC's stormwater network. A resource consent application to that regard is currently being processed by CRC.

723. Policy 25 of the NZCPS states:

*In areas potentially affected by coastal hazards over at least the next 100 years:
[...]*

- (e) Discourage hard protection structures and promote the use of alternatives to them, including natural defences. [...]*

724. The Applicant states that the Brooklands flood gates would be considered an existing hard structure. No specific future hard protection structures have been discussed by the Applicant.

725. In general, I consider that the proposed approach to flood management and mitigation is generally consistent with this policy.

National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health

726. The National Environment Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NES-CS) sets out a planning framework that ensures that land affected by contaminants in soil is appropriately identified and assessed before it is developed; and if necessary the land is remediated, or the contaminants contained to make the land safe for human use.

727. The NES-CS requires territorial authorities (district and city councils) to observe and enforce its regulations. However, under the NES-CS, regional councils are

required to investigate land for the purposes of identifying and monitoring contaminated land. To fulfil this function, the CRC maintains the LLUR, which identifies existing and potential HAIL sites.

- 728. The Applicant has not provided an assessment of the proposal against the NES-CS.
- 729. The NES-CS does not apply to assessing or managing the actual or potential adverse effects of contaminants on other receptors (e.g. groundwater, ecology, etc.). However, as discussed in the 'Effects on Soil Quality' Section above, the discharge of stormwater into land can result in contamination of soils.
- 730. As discussed, the potential adverse effects on soil quality and subsequent impacts on human health can be adequately managed, provided the resource consent conditions provide more certainty around the maintenance processes for infiltration devices.
- 731. Provided the recommended changes are adopted by the Applicant, I consider that the proposal provides for consistency with the NES-CS.

National Environmental Standards for Sources of Human Drinking Water

- 732. The National Environment Standard for Sources of Drinking Water (NES-DW) sets out requirements for issuing water and discharge permits.
- 733. Regulations 7 and 8 relate to drinking water supplies that provide for no fewer than 501 people for not less than 60 calendar days. The Regulations require that a regional council must not grant a discharge permit that will result in water abstracted from the supply not meeting the health quality criteria or for supplies that current do not meet criteria, increase the concentration of any determinand.
- 734. Regulation 12 relates to drinking water supplies that supply between 25 and 501 people for no fewer than 60 calendar days. The Applicant has not assessed this regulation. Regulation 12 requires a regional council to consider whether an activity will itself or as a consequence of an event, have a significant adverse effect on the quality of water at any abstraction point.
- 735. The Applicant states it is not proposed to add additional discharges to land where it has the potential to affect drinking water supplies, and that overall, there are not expected to be any adverse effects on drinking-water supplies as a result of the CSNDC. There are currently no known adverse effects on drinking water supply from the existing stormwater network discharges.
- 736. The Applicant has proposed mitigation to avoid future effects on drinking water supplies, in particular separation distances between new infiltration device and public and domestic supply wells. Provided the changes to these separation distances recommended by Mr Etheridge are adopted, I consider the proposal to be consistent with the NES-DW.

Canterbury Regional Policy Statement

Overview

- 737. Under Section 104(1)(b)(v) of the RMA, the consent authority shall have regard to the relevant provisions of a regional policy statement. The Canterbury Regional Policy Statement (CRPS) became operative on 15 January 2013 and has been amended in June and July 2015. The CRPS was reprinted in September 2017 to include corrections of minor errors under Clause 20A of

Schedule 1 of the RMA, as well as amendments under the Canterbury Earthquake Recovery Act 2011.

738. The CRPS provides an overview of the significant resource management issues facing the region and sets out how natural and physical resources are to be managed in an integrated, sustainable way.

Freshwater

739. **Objective 7.2.1** of the CRPS states:

The region's fresh water resources are sustainably managed to enable people and communities to provide for their economic and social well-being through abstracting and/or using water for irrigation, hydro-electricity generation and other economic activities, and for recreational and amenity values, and any economic and social activities associated with those values, providing:

- (1) The life-supporting capacity ecosystem processes, and indigenous species and their associated freshwater ecosystems and mauri of the fresh water is safe-guarded;*
- (2) The natural character values of wetlands, lakes and rivers and their margins are preserved and these areas are protected from inappropriate subdivision, use and development and where appropriate restored or enhanced; and*
- (3) Any actual or reasonably foreseeable requirements for community and stockwater supplies and customary uses, are provided for.*

740. Stormwater discharges have the potential to significantly impact on life-supporting capacity of ecosystems, indigenous species and the mauri of water. Based on the approach proposed by the Applicant, as recommended to be amended by Dr Bolton-Ritchie and Ms Stevenson, I consider that the life-supporting capacity of ecosystems and indigenous species can be safeguarded, and the natural character of waterbodies can be protected from inappropriate use. The Applicant is proposing measures that should ensure that stormwater quality is improved, which will aid in improving the life-supporting capacity of water.

741. Overall, I consider it likely that the stormwater impacts will reduce over time provided the recommended changes to the Applicant's proposed conditions are adopted, and if the proposal is fully implemented and a clear commitment to improve discharges to meet outcomes is demonstrated.

742. **Objective 7.2.3** of the CRPS states:

The overall quality of freshwater in the region is maintained or improved, and the life supporting capacity, ecosystem processes and indigenous species and their associated fresh water ecosystems are safeguarded.

743. As discussed above, the Applicant is aiming to improve the quality of the receiving environment by improving the quality of the discharge. Mitigation measures are proposed to be implemented for new development and in existing areas to improve the quality of stormwater discharges, which should aid in improving water quality across the Christchurch District and also in safeguarding the life-supporting capacity of freshwater bodies. However, as discussed above, the degree and timing of improvement is not certain, and the links between the expected improvement in discharge quality and actual effects are not well characterised.

744. **Objective 7.2.4** of the CRPS states:

Fresh water is sustainably managed in an integrated way within and across catchments, between activities, and between agencies and people with interests in water management in the community, considering:

- (1) *The Ngāi Tahu ethic of Ki Uta Ki Tai (from the mountains to the sea);*
 - (2) *The interconnectivity of surface water and groundwater;*
 - (3) *The effects of land uses and intensification of land uses on demand for water and on water quality; and*
 - (4) *Kaitiakitanga and the ethic of stewardship; and*
 - (5) *Any net benefits of using water, and water infrastructure, and the significance of those benefits to the Canterbury region.*
745. The proposal to manage stormwater discharges under one resource consent should improve the consistency in how stormwater is managed across the district. The adaptive management and SMP approach is designed to provide more integrated management in stormwater treatment, while taking into consideration the ethic of Ki Uta Ki Tai and how land use development affects water quality and quantity within each catchment. I also note that the proposal recognises the interconnectivity of surface water and groundwater, as well as the importance of the stormwater network to the Canterbury region through enabling urban development in Christchurch. On this basis I consider that the proposal is consistent with this objective.
746. **Policy 7.3.1** of the CRPS states:
- To identify the natural character values of fresh water bodies and their margins in the region and to: [...]*
- (3) *Improve natural character values where they have been degraded to unacceptable levels;*
747. The natural character values of the receiving environments are proposed to be improved, which is consistent with this policy.
748. **Policy 7.3.3** of the CRPS states:
- To promote, and where appropriate require the protection, restoration and improvement of lakes, rivers, wetlands and their riparian zones and associated Ngāi Tahu values, and to:*
- (1) *Identify and protect areas of significant indigenous vegetation and significant habitats, sites of significant cultural value, wetlands, lakes and lagoons/hapua, and other outstanding water bodies; and*
 - (2) *Require the maintenance and promote the enhancement of indigenous biodiversity, inland basin ecosystems and riparian zones; and*
 - (3) *Promote, facilitate or undertake pest control.*
749. Improvements are proposed to the water quality in lakes, rivers and wetlands, which also provide for significant cultural values to Ngā Rūnanga. However, there is uncertainty as to whether water quality all catchments will actually improve. Nonetheless, if improvements occur, this should lessen the effects of the stormwater discharges on aquatic ecosystems and aid in better protecting cultural values such as mahinga kai and the mauri of water.
750. **Policy 7.3.5** of the CRPS states:
- To avoid, remedy or mitigate adverse effects of land uses on the flow of water in surface water bodies or the recharge of groundwater by:*
- (1) *Controlling the diversion of rainfall run-off over land, and changes in land uses, site coverage or land drainage patterns that will, either singularly or cumulatively, adversely affect the quantity or rate of water flowing into surface water bodies or the rate of groundwater recharge; and*
 - (2) *Managing the planting or spread of exotic vegetation species in catchments where, either singularly or cumulatively, those species are or are likely to have significant adverse effects on flows in surface water bodies.*

751. The Applicant proposes to discharge stormwater into land where possible in order to limit the potential impacts on groundwater recharge and spring-fed waterbodies. In addition, the EMP includes monitoring of groundwater levels and spring flows to determine the effects of stormwater management systems and land use changes, and the Applicant's proposed conditions provide methods to respond. I consider that this approach is adequate to ensure that the potential effects on groundwater recharge and spring-fed waterbodies are avoided.

752. **Policy 7.3.6** of the CRPS states:

In relation to water quality:

- (1) *To establish and implement minimum water quality standards for surface water and groundwater resources in the region, which are appropriate for each water body considering:*
 - (a) *The values associated with maintaining life supporting capacity, ecosystem processes and indigenous species including their associated ecosystems, and natural character of the water body;*
 - (b) *Any current and reasonably foreseeable requirement to use the water for individual, marae or community drinking water or stockwater supplies, customary uses or contact recreation;*
 - (c) *The cultural significance of the fresh water body and any conditions or restrictions on the discharge of contaminants that may be necessary or appropriate to protect those values; and*
 - (d) *Any other current or reasonably foreseeable values or uses; and*
- (2) *To manage activities which may affect water quality (including land uses), singularly or cumulatively, to maintain water quality at or above the minimum standard set for that water body; and*
- (3) *Where water quality is below the minimum water quality standard set for that water body, to avoid [...] any additional discharge of contaminants to that water body, where any further [...] discharges, either singularly or cumulatively, may further adversely affect the water quality in that water body:*
 - (a) *Until the water quality standards for that water body are met; or*
 - (b) *Unless the activities are undertaken as part of an integrated solution to water management in the catchment in accordance with Policy 7.3.9, which provides for the redress of water quality within that water body within a specified timeframe.*

753. The LWRP sets water quality standards and outcomes for freshwater bodies and these have been used as the basis of assessing the effects of stormwater discharges and to set the Receiving Environment Targets. I note that many rivers and streams within the Christchurch District do not currently meet the minimum standards. The Applicant has carried out, and will continue to carry out, monitoring, CLM and an adaptive management approach to determine the contribution of stormwater contaminants and to develop mitigation measures to improve discharge quality. I consider that this will help with improving the overall condition of the receiving environment. I consider that the activity is inconsistent with clause (3)(a) of this policy in particular, as water quality standards may not be met, and additional discharges are sought into the waterbodies which do not meet the minimum water quality standards. However, the proposed approach, as recommended to be amended by Dr Bolton-Ritchie and Ms Stevenson, should ensure that water quality does improve as a result of integrated management of the stormwater network discharges. While no timeframe has been set within which the redress of water quality is to be provided for, I consider the proposal is not entirely inconsistent Clause (3)(b), and therefore not contrary to this policy.

754. **Policy 7.3.7** of the CRPS states:

To avoid, remedy or mitigate adverse effects of changes in land uses on the quality of fresh water (surface or ground) by:

- (1) Identifying catchments where water quality may be adversely affected, either singularly or cumulatively, by increases in the application of nutrients to land or other changes in land use; and*
- (2) Controlling changes in land uses to ensure water quality standards are maintained or where water quality is already below the minimum standard for the water body, it is improved to the minimum standard within an appropriate timeframe.*

755. Future greenfield development will result in an increase in contaminants being discharged to surface water bodies or into groundwater. The SMPs will be used to ensure that stormwater quality is improved over time in order to meet the Receiving Environment Objectives and Targets. Greenfield developments generally require a certain level of stormwater treatment to be provided and are often used to retrofit existing catchments that currently have no or insufficient treatment. While reduction targets are proposed for the contaminant loads in the discharges, the Applicant has not proposed a timeframe to achieve the Receiving Environment Targets, although a timeframe is provided for the proposed contaminant load reduction targets. Therefore, I consider that the proposal is not entirely consistent with this policy, although it is not contrary to it.

756. **Policy 7.3.9** of the CRPS states:

To require integrated solutions to the management of fresh water by developing and implementing comprehensive management plans which address the policies of this Statement including addressing all the relevant matters set out in Appendix 2.

757. The CSNDC is an integrated management approach to manage stormwater discharges throughout the Christchurch district. On this basis, I consider the proposal consistent with this policy.

758. **Policy 7.3.13** of the CRPS states:

To encourage the involvement of people and communities in the management of fresh water, including:

- (1) Community stewardship of water resources and programmes to address fresh water issues at a local catchment level;*
- (2) Ngāi Tahu, as tāngata whenua, exercising kaitiakitanga in accordance with tikanga Māori; and*
- (3) Providing opportunities for consent holders to take greater stewardship of fresh water resources, within consent conditions.*

759. As discussed above, the Applicant has consulted with the community and Ngā Rūnanga, and resource consent conditions are proposed to keep Ngā Rūnanga, Community Boards and Zone Committees involved in the stormwater management under the CSNDC.

760. I also note that that a sub-regional plan change to the LWRP for the Christchurch–West Melton Zone, which will address freshwater issues at the local catchment level, is currently scheduled in the LTP to be notified in 2022. This is addressed in more detail below.

The Coastal Environment

761. **Objective 8.2.4** of the CRPS states:

In relation to the coastal environment:

- (1) Its natural character is preserved and protected from inappropriate subdivision, use and development; and*
- (2) Its natural, ecological, cultural, amenity, recreational and historic heritage values are restored or enhanced.*

762. The Applicant has proposed to manage stormwater discharges to at least maintain coastal water quality, which will ensure that natural character of the coastal environment is sufficiently preserved. There is currently little information to determine the current stormwater impacts on the coastal environment. However, the proposed improvement of the discharge quality and water quality in water bodies will likely provide for some restoration or enhancement of the coastal environment, specifically by reducing TSS loads and heavy metal concentrations in the discharge. However, there is some uncertainty over whether the proposed reductions in contaminant loads will be achieved and over what timeframe, and therefore whether cumulative effects will be reduced.

763. **Objective 8.2.6** of the CRPS states:

Protection of coastal water quality and associated values of the coastal environment, from significant adverse effects of the point and non-point discharge of contaminants; and enhancement of coastal water quality where it has been degraded.

764. As discussed above, there is little information to determine whether existing stormwater discharges are having any significant adverse effects on the coastal environment. The proposal to set Receiving Environment Targets that are designed to protect ecological health and then work towards achieving those will ensure either water quality is maintained in a condition that supports ecological, natural and amenity values or that the quality of stormwater is improved to aid in the achievement of those targets.

765. **Policy 8.3.7** of the CRPS states:

To improve the quality of Canterbury's coastal waters in areas where degraded water quality has significant adverse effects on natural, cultural, amenity and recreational values.

766. Based on the discussion above and provided the recommended changes to consent conditions are adopted, I consider that the proposed approach and methods to be employed by the Applicant will ensure that stormwater discharges are managed to avoid adverse effects. It is not certain whether current discharges are causing significant effects but the use of SMPs to achieve the Receiving Environment Targets should aid in improving areas where stormwater is causing impacts.

767. Further, **Policy 8.3.8** of the CRPS states:

To manage discharges of contaminants into the coastal marine area to maintain coastal water quality that is currently in its natural state.

768. Areas to be managed as 'natural state' include the Waimakariri River mouth near Brooklands, the Ihutai/Avon-Heathcote Estuary, Lyttelton Harbour and Akaroa Harbour. In the absence of an SMP for Estuary and coastal areas of the district, the proposal cannot be assessed completely against this policy. However, the General City Conditions in Schedule 3 of the proposed conditions should ensure that discharges into these natural state environments are adequately managed.

Ecosystems and Indigenous Biodiversity

769. **Objective 9.2.1** of the CRPS states:

The decline in the quality and quantity of Canterbury's ecosystems and indigenous biodiversity is halted and their life-supporting capacity and mauri safeguarded.

770. **Objective 9.2.2** of the CRPS states:

Restoration or enhancement of ecosystem functioning and indigenous biodiversity, in appropriate locations, particularly where it can contribute to Canterbury's distinctive natural character and identity and to the social, cultural, environmental and economic well-being of its people and communities.

771. **Policy 9.3.3** of the CRPS states:

To adopt an integrated and co-ordinated management approach to halting the decline in Canterbury's indigenous biodiversity through:

- (1) Working across catchments and across the land/sea boundary where connectivity is an issue for sustaining habitats and ecosystem functioning;*
- (2) Promoting collaboration between individuals and agencies with biodiversity responsibilities;*
- (3) Supporting the various statutory and non-statutory approaches adopted to improve biodiversity protection;*
- (4) Setting best practice guidelines for maintaining indigenous biodiversity values, particularly maintaining conditions suitable for the survival of indigenous species within their habitats, and safeguarding the life-supporting capacity and/or mauri of ecosystems*

772. **Policy 9.3.4** of the CRPS states:

To promote the enhancement and restoration of Canterbury's ecosystems and indigenous biodiversity, in appropriate locations, where this will improve the functioning and long term sustainability of these ecosystems.

773. As discussed above, there are a number of factors that influence the quality of the receiving environment. All of these factors contribute to the quality and quantity of ecosystems and indigenous biodiversity. The proposal to improve the discharge quality should aid in halting any environmental decline, but improvements in Receiving Environment Targets such as Quantitative Macroinvertebrate Community Index (QMCI) may not be apparent due to other influences. Nonetheless, I consider that the proposal is generally consistent with the above objectives and policies.

Beds of Rivers and Lakes and their Riparian Zones

774. **Objective 10.2.2** of the CRPS states:

To maintain the flood carrying capacity of rivers.

775. **Policy 10.3.3** of the CRPS states:

To manage activities in river and lake beds and their banks or margins to:

- (1) Avoid or, where this is not practicable, to remedy or mitigate adverse effects on vegetation that controls flood flows or protects river banks or lake margins from erosion; and*
- (2) Avoid adverse effects on the stability, performance, operation, maintenance, upgrade and repair of essential structures that are located in, on, under or over a river or lake bed or its bank or margin.*

776. The Applicant proposes to manage potential flood effects as a result of stormwater discharges by setting catchment specific flood targets to be maintained or achieved (where they are not maintained). Further, design

requirements are set for new developments to control post-development discharge rates. The Applicant will also undertake flood modelling of many of the sub-catchments to demonstrate the efficacy of the mitigation measures. Large new developments will be required to model the pre and post development runoff rates to manage potential downstream flooding effects. I also note that flooding issues are related to the volume of stormwater discharges, even if the discharge rates from new development are managed (e.g. in the Halswell River catchment), and therefore hydraulic neutrality is required.

777. In addition, discharge outfalls will be designed and constructed to ensure that erosion and scour is avoided, which should ensure that bed and bank stability of waterways is not compromised. I also note that the installation of structures and associated effects will be managed by other resource consents (e.g. CCC's works in waterways global resource consent) or permitted activity requirements.
778. On this basis I consider that the proposal is consistent with the above Objective and Policy.

Natural Hazards

779. **Objective 11.2.1** of the CRPS states:

New subdivision, use and development of land which increases the risk of natural hazards to people, property and infrastructure is avoided or, where avoidance is not possible, mitigation measures minimise such risks.

780. **Objective 11.2.2** of the CRPS states:

Adverse effects on people, property, infrastructure and the environment resulting from methods used to manage natural hazards are avoided or, where avoidance is not possible, mitigated.

781. **Objective 11.2.3** of the CRPS states:

The effects of climate change, and its influence on sea levels and the frequency and severity of natural hazards are recognised and provided for.

782. **Policy 11.3.7** of the CRPS states:

New physical works to mitigate natural hazards will be acceptable only where:

- (1) The natural hazard risk cannot reasonably be avoided; and*
- (2) Any adverse effects of those works on the natural and built environment and on the cultural values of Ngāi Tahu, are avoided, remedied or mitigated.*

Alternatives to physical works, such as the relocation, removal or abandonment of existing structures should be considered.

Where physical mitigation works or structures are developed or maintained by local authorities, impediments to accessing those structures for maintenance purposes will be avoided.

783. **Policy 11.3.8** of the CRPS states:

When considering natural hazards, and in determining if new subdivision, use or development is appropriate and sustainable in relation to the potential risks from natural hazard events, local authorities shall have particular regard to the effects of climate change.

784. The Applicant proposes an approach that should ensure that new development is designed and constructed in a way to avoid exacerbating flood hazards to existing urban areas. The methods by which this will be undertaken include modelling of flood events to assess mitigation required and to determine whether mitigation is effective. The modelling will take into account the potential

impacts of climate change, and mitigation methods are to be designed with the effects of sea level rise in mind. The Applicant also proposes to retrofit existing catchments where this is practicable, although no clear statement has been provided as to whether this will also be to address the effects of climate change on existing development.

785. While there is some uncertainty around the effects of climate change on existing development, I consider that the proposal is generally consistent with these Objectives and Policies.

Contaminated Land

786. **Objective 17.2.1** of the CRPS states:

Protection of people and the environment from both on-site and off-site adverse effects of contaminated land.

787. **Policy 17.3.2** of the CRPS states:

In relation to actually or potentially contaminated land, where new subdivision, use or development is proposed on that land, or where there is a discharge of the contaminant from that land:

- (1) A site investigation is to be undertaken to determine the nature and extent of any contamination; and*
- (2) If it is found that the land is contaminated, except as provided for in Policy 17.3.3, the actual or potential adverse effects of that contamination, or discharges from the contaminated land shall be avoided, remedied or mitigated in a manner that does not lead to further significant adverse effects.*

788. **Policy 17.3.3** of the CRPS states:

Where land has been identified as being contaminated, contaminants should only be allowed to remain in the ground if discharges of contaminants beyond the site to air, water or land will not result in significant risk to human health or the environment.

789. As discussed above, I consider that the Applicant has not provided sufficient information as to how stormwater discharges from contaminated land are to be managed. In absence of a clear management approach and risk categorisation of contaminated or potentially contaminated sites, I consider that proposal in its current state is inconsistent with the Objective and Policies above. However, measures have been recommended above which could aid in managing these sites adequately. I also note that the Applicant has until 2025 to develop an appropriate approach. Therefore, provided the above recommendations are adopted, consistency with the Objective and associated Policies can be ensured.

790.

Relevant Plans

Overview

791. Under Section 104(1)(b)(vi) of the RMA, the consent authority must have regard to the relevant provisions of a plan or a proposed plan. The relevant plans and proposed plans I have considered are:

- a. The Land and Water Regional Plan;
- b. The Waimakariri River Regional Plan;
- c. The Regional Coastal Environment Plan;

- d. The Lyttelton Port Recovery Plan²⁴; and
- e. The Christchurch District Plan.

Land and Water Regional Plan

Overview

- 792. The LWRP provides the regulatory framework to support the recommended outcomes from the collaborative CWMS process. Its purpose is to provide clear direction on the management of land and water throughout the Canterbury region in order to meet community aspirations for water quality in both urban and rural areas.
- 793. The LWRP provides a number of objectives identifying the resource management outcomes or goals. The policies of the LWRP implement the plan's objectives, whereby the Strategic Policies apply to all activities and provide the overall direction while the more specific Activity and Resource Policies identify the outcome sought for different activities. Both the objectives and the policies must be considered together when assessing an activity. The LWRP also contains policies in the sub-region sections, and where such policies are on the same subject matter as the policies in Section 4, the more specific sub-region policy will take precedence (except in relation to Strategic Policies 4.2 to 4.9).
- 794. In this assessment of the relevant objectives and policies I have commented on the overall consistency of the proposal with the LWRP objectives, and consistency with each relevant policy, and provided an overall assessment considering all of the relevant provisions below.
- 795. This section also discusses the proposal in the context of the Banks Peninsula Sub-regional Section of the LWRP (Section 10), and the sub-regional plan change for the Christchurch–West Melton Zone, which is currently scheduled in the LTP for 2022, and the requirements under the PC5 Policy 4.11.

Objectives

- 796. The objectives in the LWRP identify the resource management outcomes or goals for the Canterbury Region to achieve the purpose of the RMA. As stated in the LWRP, the objectives should be read and considered together.
- 797. I consider the following objectives are the most relevant to the CSNDC:

Objective 3.1 – *Land and water are managed as integrated natural resources to recognise and enable Ngāi Tahu culture, traditions, customary uses and relationships with land and water.*

Objective 3.2 – *Water management applies the ethic of ki uta ki tai-from the mountains to the sea-and land and water are managed as integrated natural resources, recognising the connectivity between surface water and groundwater, and between fresh water, land and the coast.*

Objective 3.6 – *Water is recognised as essential to all life and is respected for its intrinsic values.*

Objective 3.8 – *The quality and quantity of water in fresh water bodies and their catchments is managed to safeguard the life-supporting capacity of ecosystems and ecosystem processes, including ensuring sufficient flow and quality of water to support the habitat, feeding, breeding, migratory and other behavioural*

²⁴ Under section 60(2)(a) of the Greater Christchurch Regeneration Act 2016, the decision-maker on this resource consent application must not make a decision that is inconsistent with the LPRP.

requirements of indigenous species, nesting birds and where appropriate trout and salmon.

Objective 3.8A – *High quality fresh water is available to meet actual and reasonable foreseeable needs for community drinking water supplies.*

Objective 3.11 – *Water is recognised as an enabler of the economic and social wellbeing of the region.*

Objective 3.13 – *Groundwater resources remain a sustainable source of high quality water which is available for abstraction while supporting base flows or levels in surface water bodies, springs and wetlands and avoiding salt water intrusion.*

Objective 3.15 – *Those parts of lakes and rivers that are valued by the community for recreation are suitable for contact recreation.*

Objective 3.16 – *Freshwater bodies and their catchments are maintained in a healthy state, including through hydrological and geomorphic processes such as flushing and opening hāpua and river mouths, flushing algal and weed growth and transporting sediment.*

Objective 3.17 – *The significant indigenous biodiversity values of rivers, wetlands and hāpua are protected.*

Objective 3.22 – *The effectiveness of both man-made natural hazard protection infrastructure, and wetlands and hāpua as natural water retention areas, is maintained to reduce the risk of and effects from natural hazards, including those arising from seismic activity and climate change.*

Objective 3.24 – *All activities operate at good environmental practice or better to optimise efficient resource use and protect the region's fresh water resources from quality and quantity degradation.*

798. I consider that the proposal will ensure that stormwater discharges are managed in an integrated way across the Christchurch District. I consider this integration will ensure that the effects of land use change within each catchment and the influence of stormwater discharges on groundwater and surface water is appropriately addressed in a more cohesive manner. With regards to managing the effects to support multiple uses, the Applicant acknowledges the importance of the different values that surface water bodies have and that the goals to improve stormwater quality should support those values. While many parts of the stormwater network do not currently provide for adequate treatment, and therefore do not operate at good environmental practice, conditions are proposed by the applicant that require retrofitting of existing development where this is practicable.
799. With regard to the C-CLM indicating improvements in contaminant loads across all modelled catchments, I note that significant concerns are raised around the certainty as to whether improvements will occur.
800. Based on the discussion provided in the 'Existing Environment' Section above, the proposal would likely be contrary to the LWRP objectives if the stormwater network discharges were considered a 'new activity' and without any consideration of legacy effects from past lawful discharges. This is mainly due to the effects that the discharges would have on the existing environment (i.e. ecosystems, cultural values, recreational values, etc.) if this was considered as if no previous stormwater discharges had occurred. However, as set out by the Applicant, and as discussed in previous sections of this report, I consider that the effects from past lawful discharges should form part of the existing environment. Further, there may be grounds to consider the existing discharges as part of the existing environment, since the stormwater discharges are inseparable from Christchurch City's and Banks Peninsula's

presence, and it is not feasible to consider the stormwater discharges as not existing. This will need to be established by the Applicant.

801. With regards to recognising and enabling cultural uses of water bodies, I understand that the Applicant has come to an agreement with Ngā Rūnanga regarding the proposed conditions and the submission by the Ngāi Tahu parties on the initial application CRC160056, which has not been provided to CRC. Without having viewed this agreement, and in absence of the comments required from Ngā Rūnanga on other aspects of the proposal, I am unable to conclude whether the proposal is consistent with the above relevant objectives.
802. In summary, I consider that while the proposal is not entirely consistent with the above objectives, it is not contrary to the LWRP objectives overall.

Strategic Policies

803. Policy 4.1 takes precedence over the relevant sub-region policies unless catchment specific outcomes have been specified in the sub-region section. Policies 4.2 to 4.9 apply in addition to any activity-specific policies and the sub-region sections of the LWRP.

804. **Policy 4.1** of the LWRP states:

Lakes, rivers, wetlands and aquifers will meet the fresh water outcomes set in sections 6 to 15 within specified timeframes. If outcomes have not been established for a catchment, then each type of lake, river or aquifer should meet the outcomes set in Table 1 by 2030.

805. The LWRP has not set freshwater outcomes in the sub-regional Sections 9 and 10 and directs users to the region-wide objectives and policies. Table 1a sets the Freshwater Outcomes for Canterbury Rivers, which include indicators for ecological health, macrophytes, periphyton, siltation and microbiological indicators. The Applicant has provided information that shows that these outcomes are not currently met in the Avon and Heathcote catchments. While the proposed Receiving Environment Objectives and Targets incorporate the most relevant parameters from this table, it is unlikely that these targets will be met by 2030. This is either due to the limitations to implement mitigation methods or as there are other influences on these measures that are not stormwater related. I consider that the Applicant has shown, and proposes to show, initiative to work towards meeting the Freshwater Outcomes. While on this basis the proposal is not contrary to this policy, it is inconsistent with it as the timeframe will not be met.

806. **Policy 4.2** of the LWRP states:

The management of lakes, rivers, wetlands and aquifers will take account of the fresh water outcomes, water quantity limits and the individual and cumulative effects of land uses, discharges and abstractions will meet the water quality limits set in Sections 6 to 15 or Schedule 8 and the individual and cumulative effects of abstractions will meet the water quantity limits in Sections 6 to 15.

807. As discussed above, there are no water quality limits or outcomes specified in Sections 9 or 10 of the LWRP. Schedule 8 does include relevant surface water quality limits and the Applicant has provided information that shows that CCC is working on improving the discharge quality to work towards meeting Freshwater Outcomes for rivers. With regards to groundwater quality, the Applicant has proposed Receiving Environment Targets that are based on the limits specified in Schedule 8. Schedule 8 also includes limits for nitrate toxicity but as discussed above, nutrients are not a major stormwater contaminant and are more likely to come from other sources. As the Applicant proposes to

improve discharge quality and meet targets based on the relevant Schedule 8 limits, I consider that the freshwater outcomes, water quantity limits and the individual and cumulative effects of the stormwater discharges have been taken into account. The proposal is therefore consistent with this aspect of this policy.

808. Sections 9 and 10 do include water quantity limits for specific waterways. In terms of the Applicant's proposal the most vulnerable waterbodies with regards to water quantity impacts are the spring-fed waterways in Christchurch City. The Applicant has proposed to include measures in the SMPs to ensure that stormwater is discharged to land to avoid significant effects on the base flows of these waterbodies where possible.

809. Overall, provided the above recommendations are included, the proposal would be consistent with this policy.

810. **Policy 4.3** of the LWRP states:

Surface water bodies are managed so that:

- (a) *Toxin producing cyanobacteria do not render rivers or lakes unsuitable for recreation or human and animal drinking water*
- (b) *Fish are not rendered unsuitable for human consumption by contaminants;*
- (c) *The natural colour of the water in a river is not altered;*
- (d) *The natural frequency of hāpua, coastal lakes, lagoons and river openings is not altered;*
- (e) *The passage for migratory fish species is maintained unless restrictions are required to protect populations of native fish;*
- (f) *Reaches of rivers are not induced to run dry, thereby maintaining the continuity of river flow from source to sea; and*
- (g) *Variability of flow, including floods and freshes, is maintained to avoid prolonged "flat-lining" of rivers; to facilitate fish passage and to mobilise bed material"*

811. With regards to Policy 4.3(b), the Applicant's proposal to improve the quality of stormwater treatment over time in order to achieve the proposed Receiving Environment Targets for waterways will assist in ensuring that fish are not rendered unsuitable for human consumption (due to stormwater contaminants adsorbed in the fish flesh). The discharge of stormwater, particularly containing suspended sediment, has the potential for changes in water colour to occur. These changes are typically temporary, and the Applicant is proposing to improve the quality of discharges to meet a sediment cover target. I consider that the proposal is consistent with this policy.

812. **Policy 4.4** of the LWRP states:

Groundwater is managed so that: [...]

- (e) *Overall water quality in aquifers does not decline.*

813. The Applicant has proposed measures to ensure that stormwater discharged to ground is sufficiently treated prior to entering groundwater to avoid widespread contamination and impacts on drinking water supplies. The Applicant acknowledges that there is the potential for localised impacts in shallow groundwater, particularly from *E. Coli* and these are to be managed by investigating infiltration devices and ensuring new devices are sited to avoid effects on other groundwater users.

814. With regard to the management of construction-phase discharges and operational phase stormwater discharges from HAIL and industrial sites, the Applicant has not provided sufficient information on how these discharges will

be managed under the CSNDC (refer to 'Effects During Construction and Development' and 'Effects of Discharges from HAIL and Industrial Sites' Sections above). Recommendations to this effect have been made above.

815. Provided the recommendations discussed above are included as conditions of consent, I consider that overall the proposal is unlikely to result in any overall decline in water quality, and therefore consistency is provided with this policy. Without adoption of the recommended changes, there are potential risks to groundwater quality if high-risk HAIL and industrial sites are not well managed, which would potential lead to inconsistency with this policy.

816. **Policy 4.7** of the LWRP states:

Resource consents for new or existing activities will not be granted if the granting would cause a water quality or quantity limit set in Sections 6 to 15 to be breached or further over allocation (water quality and/or water quantity) to occur or in the absence of any water quality standards in Sections 6 to 15, the limits set in Schedule 8 to be breached. [...]

817. As discussed above, there are Schedule 8 water quality limits that are relevant to the proposal, as well as surface water quantity limits in Sections 9 and 10. Based on the progressive improvement the quality of stormwater discharges and to manage water quantity effects on spring-fed rivers, I consider that subject to the adopting the changes recommended by the technical experts, granting the proposal is unlikely to result in any further over-allocation of the relevant Schedule 8 limits or the surface water quantity limits in Sections 9 or 10. I note that no stormwater specific sub-regional freshwater outcomes or limits have been set for either the Christchurch–West Melton Zone or the Banks Peninsula Zone, with the exception for some outcomes for rivers within the Te Roto ō Wairewa / Lake Forsyth catchment, which are listed in Table 10(b) of the LWRP.

818. **Policy 4.8A** of the LWRP states:

(1) *When considering any application for a discharge the consent authority must have regard to the following matters:*

- (a) *The extent to which the discharge would avoid contamination that will have an adverse effect on the life-supporting capacity of fresh water including on any ecosystem associated with fresh water; and*
- (b) *The extent to which it is feasible and dependable that any more than minor adverse effect on fresh water, and on any ecosystem associated with fresh water, resulting from the discharge would be avoided.*

(2) *When considering any application for a discharge the consent authority must have regard to the following matters:*

- (a) *The extent to which the discharge would avoid contamination that will have an adverse effect on the health of people and communities as affected by their secondary contact with freshwater; and*
- (b) *The extent to which it is feasible and dependable that any more than minor adverse effect on the health of people and communities as affected by their secondary contact with fresh water resulting from the discharge would be avoided. [...]*

819. The CSNDC proposal seeks to avoid further contamination and reduce existing contamination as a result of the stormwater discharges. Based on the C-CLM, the proposal to progressively reduce contaminant loads across the modelled catchments. While there are uncertainties around the actual contaminant load reductions, I consider that the proposal is generally consistent with this policy as the overall intent of the proposal is to work towards meeting the LWRP freshwater outcomes.

Activity and Resource Policies

820. **Policy 4.13** of the LWRP states:

For other discharges of contaminants into or onto land where it may enter water or to surface water bodies or groundwater (excluding those passive discharges to which Policy 4.26 applies), the effects of any discharge are minimised by the use of measures that:

- (a) First avoids the production of the contaminant;*
- (b) Secondly, reuse, recover or recycle the contaminant;*
- (c) Thirdly minimise the volume or amount of the discharge;*
- (d) Finally, wherever practical utilise land-based treatment, a wetland constructed to treat contaminants or designed treatment system prior to discharge; and*
- (e) In the case of surface water, results in a discharge that after reasonable mixing meets the receiving water standards in Schedule 5 or does not result in any further degradation in water quality in any receiving surface waterbody that does not meet the water quality standards in Schedule 5 or any applicable water conservation order.*

821. In accordance with the assessment against the current LWRP provision, the Applicant is proposing methods to address contaminants at their source. With regards to Clause (e) of this policy, the Applicant has used the relevant standards in Schedule 5 as target values. However, the standards apply to the receiving environment after the discharge is mixed. While applying mixing zones is difficult for the CCC's stormwater network discharges due to the size of the network and the number of stormwater outfalls, the Applicant acknowledges that these targets are not currently being met. While the Applicant has committed to improve the quality of stormwater discharges in order to work towards achieving these standards, there is uncertainty around how and when these improvements will be achieved. Further, the C-CLM does not clearly outline if improvements in water quality will be achieved in all modelled catchments, although an overall improvement is anticipated across all catchments. I am therefore unable to comment on whether the proposal, as it stands, is consistent with the second part of Clause (e), due to the uncertainties around whether the proposed mitigation is sufficient to ensure that water quality in all receiving surface water bodies will not be degraded further.

822. **Policy 4.14** of the LWRP states:

Any discharge of a contaminant into or onto land where it may enter groundwater (excluding those passive discharges to which Policy 4.26 applies)

- (a) Will not exceed the natural capacity of the soil to treat or remove the contaminant; and*
- (b) Will not exceed the available water storage capacity of the soil; and*
- (c) Where meeting (a) and (b) is not practicable, the discharge will*
 - (i) Meet any nutrient limits in Schedule 8 or Sections 6 to 15 of this plan; and*
 - (ii) Utilise the best practicable options to ensure the size of any contaminant plume is as small as reasonably practicable; and*
 - (iia) Ensure there is sufficient distance between the point of discharge, any other discharge and drinking water supplies to allow for the natural decay or attenuation of pathogenic micro-organisms in the contaminant plume; and*
 - (iii) Not result in the accumulation of pathogens or a persistent or toxic contaminant that would render the land unsuitable for agriculture,*

commercial, domestic cultural or recreational use or water unsuitable as a source of potable water or for agriculture; and

(iv) Not raise groundwater levels so that drainage is impeded.

823. The Applicant proposes stormwater treatment methods which have the potential to exceed the natural capacities of soil to remove contaminants or to store water, particularly devices such as infiltration systems. On this basis in accordance with Clause (c), of this policy meeting Clauses (a) and (b) may not be not practicable, although the EMP proposes soil monitoring to ensure that the infiltration treatment facilities do not accumulate contaminants to a point where they may negatively impact groundwater quality.
824. The Applicant states that groundwater surrounding infiltration devices may contain concentrations of contaminants, particularly *E. coli* that exceed the Schedule 8 limits. However, the Applicant proposes mitigation to ensure that drinking water supplies are not adversely affected by requiring minimum separation distances from domestic supply wells as well as an attribute target to ensure that the concentration of *E. coli* does not increase at drinking water supply wells.
825. Changes to the proposed separation distances for new infiltration devices are recommended. I also recommended additional conditions that require an alternative source of drinking water be provided for potentially affected bore owners if contamination has been identified that originates from any nearby stormwater discharge under the CSNDC (if granted), unless an assessment is provided to CRC that shows that water quality obtained from any domestic well is adequate for human consumption, if these bores are near an existing or new infiltration device.
826. For wider groundwater quality effects, the proposed EMP will ensure that groundwater quality is monitored to ensure adverse effects from the proposed discharges on drinking water supplies are mitigated.
827. Regarding the potential effects on groundwater levels, again the Applicant has proposed conditions requiring that any new infiltration devices need to be designed, located and operated to avoid, remedy or mitigate adverse effects of groundwater mounding on other land. While this condition applies to new basins only, existing infiltration devices are not proposed to be upgraded. I also note that no information has been provided that addresses the Applicant's ability to deal with emerging effects from existing infiltration facilities. This means that the proposal is not entirely consistent with Policy 4.14 of the LWRP. However, I consider the proposal is not contrary to this policy.
828. **Policy 4.14B** of the LWRP states:
- Have regard to Ngāi Tahu values, and in particular those expressed within an iwi management plan, when considering applications for discharges which may adversely affect statutory acknowledgement areas, nohoanga sites, and cultural landscapes identified in this plan or in any iwi management plan.*
829. The Applicant consulted with Ngā Rūnanga and reached an agreement regarding the proposed conditions and the submission made by the Ngāi Tahu parties on the original application CRC160056. Further to this, the Applicant proposes to engage with Papatipu Rūnanga during the development and review of SMPs, the development of the Implementation Plan and at the concept design stages for new stormwater treatment facilities and devices. The Applicant also proposes to report back to Papatipu Rūnanga on stormwater developments, projects and monitoring carried out under the CSNDC, and hold annual meetings to ensure Papatipu Rūnanga can provide input to the

developments. On this basis, I consider that the proposal is consistent with this policy.

830. **Policy 4.15** of the LWRP states:

In urban areas, the adverse effects on water quality, aquatic ecosystems, existing uses and values of water and public health from the cumulative effects of sewage, wastewater, industrial or trade waste or stormwater discharges are avoided by: [...]

- (ab) All stormwater being discharged to land or into reticulated system, where a reticulated system is available;*
- (b) All stormwater being discharged in accordance with a stormwater management plan, where one has been consented;*
- (d) Any reticulated stormwater or wastewater system installed after 11 August 2012 is designed and managed to avoid sewage discharge into surface water.*

831. The Applicant has already prepared three complete stormwater management plans and has proposed a timeframe for submitting four other plans to be reviewed by CRC prior to their implementation.

832. The design of the stormwater system will be undertaken in a manner to avoid any sewage discharge into surface water. However, as stated above, I consider that the Applicant will also be required to continue to repair and upgrade where necessary the reticulated wastewater network to reduce over time wet weather overflows into the CCC's stormwater network.

833. **Policy 4.16** of the LWRP states:

Any reticulated stormwater system for any urban area is managed in accordance with a stormwater management plan that addresses the following matters:

- (a) The management of all discharges of stormwater into the stormwater system; and*
- (b) For any reticulated stormwater system established after 11 August 2012, including any extension to any existing reticulated stormwater system, the discharge of stormwater being subject to land-based or designed treatment system, or wetland treatment prior to any discharge to a lake or river; and*
- (c) How any discharge of stormwater, treated or untreated, into water or onto land where it may enter water meets or will meet the water quality outcomes and standards and limits for that waterbody set out in Table 1, Schedules 5 and 8 and sections 6 to 15 (whichever applies); and*
- (d) The management of the discharge of stormwater from site involving the use, storage or disposal of hazardous substances; and*
- (e) Where the discharge is from an existing local authority network, demonstration of a commitment to progressively improve the quality of the discharge to meet condition (c) as soon as practicable but no later than 2025.*

834. The three SMPs that have been developed to date do not address the management of all discharges to the network. Notwithstanding this, provided the recommended changes to the proposal outlined throughout this report are adopted by the Applicant, a review of the existing SMPs will occur within two years. The remaining four SMPs will be developed by the end of 2020.

835. As discussed above the proposal is not entirely consistent with Clauses (a) and (d) of this policy as some sites, for which discharge permits have been granted recently for a duration in excess of the duration sought for the CSNDC, will continue to be excluded, potentially beyond the duration of the resource consent sought (e.g. a discharge permit granted in 2017 for a duration of 35

years would expire in 2052, i.e. 9 years after the CSNDC would expire, if granted in 2018). Further, as discussed in the 'Effects of Operational Discharges from HAIL and Industrial Sites' Section above, it may be beneficial to provide for a mechanism within the CSNDC to exclude sites that pose a particularly high risk, sites that do not comply with CSNDC conditions or CCC's authorisations or repeat offenders that show a lack in commitment to improve the discharge quality from their sites.

836. The SMPs that have been developed to date and the conditions proposed that specify the requirements for a SMP provide for treatment methods that are consistent with Policy 4.16(b).
837. The application, proposed conditions and the SMPs identify that current stormwater discharges into surface waterways and groundwater do not meet the freshwater outcomes set in Table 1, the receiving environment standards (Schedule 5) or the Schedule 8 limits. However, these outcomes, standards and limits are proposed to be used as the targets to be achieved through the implementation of measures to improve the quality of stormwater discharges. For greenfield development I consider that the Applicant will be able to ensure that best practice stormwater treatment is undertaken in order to meet the Schedule 5 or Schedule 8 limits. The Table 1 outcomes are measured within the receiving environment, and unlike the Schedule 5 standards it is more difficult to isolate the contributions of stormwater discharges to the quality of the environment. Because of this, I consider that the Table 1 outcomes may not be met, even from new growth areas. This is because of the current state of the environment and the influences of other contaminant sources on these outcomes. Therefore, the proposal is inconsistent with Clause (c) of this policy.
838. For the existing urban area, the Applicant states that it is unlikely that the achievement of the Table 1 Outcomes, Schedule 5 Receiving Environment Standards and Schedule 8 Limits will occur prior to 2025. I consider that given the current state of the environment and the methods available to the Applicant, the achievement of these measures will be extremely unlikely within the timeframe set in the policy. However, as discussed in the NPS-FM Section above, I consider that when assessing objectives and policies in the LWRP as a whole, then Policy 4.16(e) may be interpreted on the basis that it requires, in these circumstances, CCC to demonstrate its commitment by 2025 to progressively improve the quality of the discharge to meet specified water quality outcomes in the future (i.e. post 2025).
839. In addition, as some of these measures are applied within the receiving environment, the policy only relates to stormwater discharges and does not recognise the influence of other contaminant sources. The CSNDC does, however, provide a framework for working towards the achievement of these outcomes, standards and limits through improving discharge quality through using CLM and identifying measures to reduce effects of the discharges, through the setting of the Receiving Environment Targets, and through the cycle of implementing methods, monitoring progress and adapting the approach.
840. The Applicant has committed to work towards achieving the LWRP freshwater outcomes; however, to achieve this, sufficient certainty needs to be provided around the Applicant's intent to improve the stormwater discharge quality and the commitment to work towards achieving the LWRP outcomes.
841. Overall, I consider that Policy 4.16 provides a very clear message to network operators and the public that network operators must show a commitment to progressively improve the quality of the discharge by 2025 to work towards

meeting the LWRP Freshwater Outcomes, standards and targets. I consider that currently the proposal may not provide for the level of certainty required under this policy and the NPS-FM that improvements will be made within a specified timeframe, which is mainly due to the concerns around the C-CLM discussed above. Nonetheless, I am of the opinion that adopting the recommended changes detailed in the 'Effects' Sections above would enable the CSNDC to be generally consistent with Policy 4.16(e).

842. Overall, on the basis of the above assessment, I consider that while the proposal may not be entirely consistent with Policy 4.16 of the LWRP, it is not contrary to this policy provided the recommended changes to the proposed conditions are adopted by the Applicant.

843. **Policy 4.16A** of the LWRP states:

Operators of reticulated stormwater systems implement methods to manage the quantity and quality of all stormwater directed to and conveyed by the reticulated stormwater system, and from 1 January 2025 network operators account for and are responsible for the quality and quantity of all stormwater discharged from that reticulated stormwater system.

844. While CCC proposes to accept all stormwater discharges to the reticulated network (where available) from 2025 onwards, some sites for which specific resource consent have already been granted that expires at a later date will be excluded. On this basis, while the proposal for the most part is not contrary to this policy, I consider that it is not entirely consistent as some sites will continue to be excluded, potentially beyond the duration of the CSNDC (if granted). I also note that there is no certainty as to whether CCC will accept all new discharges prior to 2025, or whether new developments will be required to apply for individual resource consents. I also note that CRC is still to consider an appropriate duration for such individual resource consents, should these be sought prior to 2025.

845. Further, as discussed above, there may be a need for a mechanism within the CSNDC to exclude sites that pose a particularly high risk, sites that do not comply with CSNDC conditions or CCC's authorisations or repeat offenders that show a lack in commitment to improve the discharge quality from their sites. If individual discharge permits are sought for such sites, CRC will be able to provide assistance to CCC by assessing these discharges under Section 15 of the RMA and monitor those resource consents individually.

846. The investment in existing resource consents should also be recognised, as well as providing certainty for holders of existing resource consent to manage stormwater discharges from individual sites.

847. In summary, provided the approaches to manage construction and high-risk sites are developed prior to 2025, I consider that consistency with this policy can be ensured.

848. **Policy 4.17** of the LWRP states:

Stormwater run-off volumes and peak flows are managed so that they do not cause or exacerbate the risk of inundation, erosion or damage to property or infrastructure downstream or risks to human safety.

849. The Applicant states that the CSNDC and SMPs do or will address stormwater run-off volumes and peak flows, and that one of the principles of the proposed conditions is the reduction of the adverse effects of flooding. Proposed conditions require the SMPs to identify areas subject to known flood hazards and use reasonable endeavours to mitigate the effects of the stormwater discharges on water quantity to achieve compliance with the Receiving

Environment Targets. Schedule 7 of the proposed conditions proposes a maximum allowable increase in the modelled 50-year ARI flood level is adopted for each of the major river catchments, while alternative approaches are to be taken in the un-modelled catchments, where new development shall not exceed the pre-development peak flows.

850. While I consider that the proposal is not contrary to this policy, I note that Mr Law highlighted that recommended additional modelling points in each catchment and that information about adequacy of maximum water level increases are required for the main catchments be provided. I also note that for the Ōtukaikino catchment it has not been demonstrated through modelling that the Partial Detention approach to stormwater management will deliver the desired catchment-wide mitigation. On this basis, there is not sufficient information provided to ensure that the proposal is consistent with this policy. However, the changes recommended to conditions address these information gaps. Therefore, provided the recommendations are included as conditions of consent, I consider the proposal to be generally consistent with this policy.

851. **Policy 4.18** of the LWRP states:

The loss or discharge of sediment or sediment-laden water and other contaminants to surface water from earthworks, including roading, works in the bed of a river or lake, land development or construction, is avoided, and if this is not achievable, the best practicable option is used to minimise the loss or discharge to water.

852. Sediment discharges from construction sites and new subdivisions are one of the most significant sources of sediment in stormwater. The Applicant has proposed conditions that require an ESCP to be prepared and implemented for construction and/or earthworks activities in general accordance with the ESC Toolbox to ensure that best practice options are adopted. Construction activities and the implementation of ESCPs are proposed to be monitored as part of the building and subdivision consenting inspections and monitoring; however, while it is proposed to monitor construction sites prior to site clearances commencing and throughout the construction process, no clear process has been provided as to how this will occur. It is also unclear if budget is available for these actions, roles and responsibilities, and delegations for staff are needed to support this.

853. Given the significance of sediment discharges and the associated environmental impacts, I have recommended changes to the proposed conditions to ensure that the Applicant provides a robust methodology to manage construction sites and to minimise sediment discharges.

854. Subject to inclusion of these recommendations and provided a robust approach to ESC is developed by the Applicant, I consider the proposal would be consistent with this policy. The application is inconsistent with this policy in its current form.

855. **Policy 4.22** of the LWRP states:

Sedimentation of water bodies as a result of land clearance, earthworks and cultivation is avoided or minimised by the adoption of control methods and technologies, such as maintaining continuous vegetation cover adjacent to water bodies, or capturing surface run-off to remove sediment and other contaminants or by methods such as direct drilling crops and cultivation that follows the contours of a paddock.

856. As discussed above, changes to the proposal are recommended to require developments to prepare and implement ESCPs to specify methods to

minimise sediment run-off into waterways. The key is to ensure that these measures are implemented effectively throughout construction activities. This can be achieved by means of the recommended methodology to monitor the implementation of ESCPs, which should ensure that sediment discharges are minimised, and that compliance monitoring and inspection are carried out by CCC staff to ensure consistency with this policy be provided.

857. **Policy 4.23** of the LWRP states:

Any water source used for drinking water supply is protected from any discharge of contaminants that may have any actual or potential adverse effect on the quality of the drinking water supply including its taste, clarity and smell and group and community drinking water supplies are protected so that they align with the CWMS drinking water targets and meet the drinking water standards for New Zealand.

858. The discharge of stormwater into land near community, group or private drinking water supplies has the potential to adversely affect the quality of drinking water abstracted from these sources. The CWMS drinking water targets specify objectives that include increasing the population supplied with water that meets the New Zealand Drinking Water Standards, understanding emerging contaminant risks and achieving average annual nitrate levels in groundwater below 50% of the Maximum Allowable Value for drinking water.

859. I consider that CCC, in its role as a territorial authority, has the primary responsibility for supplying drinking water that meets the New Zealand Drinking Water Standards. However, it is the CRC's responsibility to protect water quality in receiving environment, including aquifers. The measures proposed to avoid contamination risks and monitor the impacts of stormwater discharges were generally supported by Mr Ethridge subject to some amendments to the proposed conditions. On this basis, I consider the proposal is consistent with this policy.

860. **Policy 4.55** of the LWRP states:

Any discharge of water resulting from moving water from one catchment or water body to another is particular:

- (a) Does not facilitate the unwanted transfer of fish species, plant pests or unwanted organisms into catchments where they are not already present;*
- (b) Takes into account Ngāi Tahu values;*
- (c) Does not have a more than minor adverse effect on the natural character of the receiving water;*
- (d) Does not compromise the ability of existing drinking water treatment systems to effectively treat the water to achieve the standards set out in the Drinking water Standards for New Zealand; and*
- (e) Does not have a more than a minor adverse effect on fish migration.*

861. As part of the South West Area SMP, the Applicant has proposed a stormwater treatment device at Halswell Junction Road, which will divert stormwater from the Huritini/Halswell River catchment into the Ōpāwaho/Heathcote River catchment. The Applicant states that this proposal is in order to reduce the discharge from industrial areas to the Huritini/Halswell River. Given the resource consent duration of the South West 'global' (CRC120223, which expires in April 2047) exceeds the duration proposed for the CSNDC (25 years), I am of the opinion that this issue has been addressed adequately in granting resource consent CRC120223.

862. Notwithstanding this, with regards to taking into account Ngāi Tahu values, I consider that Ngā Rūnanga will be consulted with when finalising the CIAs for the Huritini/Halswell River catchment and the SMP development for the

Ōpāwaho/Heathcote River catchment. On the basis that the Huritini/Halswell River SMP is amended within two years of granting of the CSNDC as per the recommended changes to the Applicants Proposed Condition 4 and Table 1, and Papatipu Rūnanga inputs are incorporated as per the CSNDC requirements, I am of the opinion that the consistency with this policy will be provided for.

863. **Policy 4.81** of the LWRP states:

Any [...] discharge of contaminants onto land or into water [...] do not adversely affect the significant values of wetlands, hāpua, coastal lakes and lagoons, except for:

- (a) Temporary and or minor adverse effect where that activity is part of installing, maintaining, operating or upgrading infrastructure, pest management, or habitat restoration or enhancement work;*
- (b) The artificial opening of hāpua, coastal lakes and lagoons to assist in fish migration or achieving other conservation outcomes, customer uses, or to avoid land inundation.*

864. There are coastal lakes, lagoons and wetlands within the Christchurch District area that receive stormwater directly or indirectly. As discussed, the proposal seeks to improve stormwater discharge quality over time and working towards Freshwater Outcomes. The proposal to discharge stormwater to land where possible should also mean that water levels will not be significantly affected in these areas. However, while I do not consider the proposal to be contrary to this policy, I note that the stormwater discharges to water may continue to adversely affect water quality in wetlands, lagoons and coastal lakes throughout the district for the duration of the resource consent. This is because of the current state of the environment (including cultural values), which is adversely affected by the operation of existing infrastructure. Therefore, I consider that the proposal is not entirely consistent with this policy.

865. **Policy 4.84** of the LWRP states:

Wetlands and riparian planting are developed as integral parts of land drainage systems, discharges to land and water and stormwater systems in both rural and urban areas, to reduce the effects of those activities on water quality and to enhance indigenous biodiversity and amenity values.

866. The mitigation methods outlined in the application include a number of systems, which include planting such as ponds, swales and constructed wetlands. The Applicant describes that a multi-value approach for stormwater treatment is preferred when it comes to selecting mitigation methods. The values include landscape, ecology, recreation, culture, heritage as well as drainage. On this basis I consider the proposal is consistent with this policy.

867. **Policy 4.92** of the LWRP states:

Communities are protected from natural hazards of flooding and erosion through gravel extraction and establishment and maintenance of flood protection assets.

868. The Applicant considers the waterways of Christchurch as part of the stormwater network. Activities are undertaken to maintain the flow capacity of these waterways such as clearing debris, silt and excessive vegetation. Removal of sediment build up following the earthquakes has also been undertaken and will be undertaken in future. On this basis, I consider the proposal is consistent with this policy.

Sub-regional Policies

869. **Policy 9.4.1** of the LWRP states:

Protect the high quality, untreated groundwater sources available to Christchurch City as a potable water supply in the area shown on the Planning Maps as the Christchurch Groundwater Protection Zone by: [...]

(b) Controlling the use of land where activities involve the aggregation of large quantities of hazardous substances to ensure the risks of spill leaching or other contamination of groundwater are appropriately managed; and [...]

870. The Applicant proposes to accept discharges from all high-risk sites from 2025, including sites where large quantities of hazardous substances are stored, unless a site-specific resource has been granted that expires at a later date. While the inclusion of all sites by 2025 ensures consistency with Region-wide Policy 4.16A, there is uncertainty around how the discharges into land from new high-risk sites are being managed. While I do not consider the proposal to be contrary to this sub-regional policy, it is not consistent with it as there is no certainty at this time around how CCC proposes to control discharges from such high-risk sites. However, to achieve consistency with this policy, it has been recommended that a robust approach to managing stormwater discharges from new high-risk sites is developed prior to 2025.

871. **Policy 9.4.9** of the LWRP States

To accommodate geological alterations to the land and its relationship with surface water bodies within Christchurch City, resulting from the recent seismic events, and to prevent any increase in inundation of land in the lower catchments, the discharge to surface water of any stormwater in the Avon/Ōtākaro or Heathcote catchments that is not within an area covered by a consented stormwater management plan will require specific evaluation, including of downstream flooding potential, through a resource consent process.

872. The Applicant provided a SMP for the Ōtākaro/Avon River catchment with the application, and a SMP has already been prepared for the Ōpāwaho/Heathcote River catchment. I also note that stormwater discharged under the CSNDC from any area that is not currently managed under a SMP requires specific consideration as described in Schedule 3 of the proposed conditions. On the basis that CCC will eventually manage the majority of existing and all new discharges within these catchments under the two SMPs, I consider that the proposal is consistent with this policy.

873. **Policy 9.4.10** of the LWRP states:

To prevent any increase in inundation of land in the Halswell River/Huritini Catchment, the discharge to surface water of any stormwater or drainage water in the Halswell River/Huritini Catchment that is not within an area covered by a consented stormwater management plan will require specific evaluation to ensure hydraulic neutrality through a resource consent process.

874. I note that stormwater discharged under the CSNDC from any area that is not currently managed under a SMP requires specific consideration as described in Schedule 3 of the proposed conditions. On the basis that CCC will eventually manage the majority of existing and all new discharges within these catchments under the two SMPs, I consider that the proposal is consistent with this policy.

Proposed Plan Change 5 (Decisions)

875. Plan Change 5 to the LWRP (PC5) seeks changes to the Sub-regional Section Development **Policy 4.11** (among others). The decisions version of the proposed policy states:

The setting and attainment of catchment specific water quality and quantity outcomes and limits is enabled through:

- (a) *Limiting the duration of any resource consent granted under the region-wide rules in this Plan to a period not exceeding five years past the expected notification date (as set out in the Council's Progressive Implementation Programme) of any plan change that will introduce water quality or water quantity provisions into Sections 6 – 15 of this Plan; [...]*
876. PC5 has progressed through the plan change process and has been subject to significant testing and independent decision making. PC5 is now beyond challenge, including Sub-regional Section Development Policy 4.11. I also note that Policy 4.11 is considered to apply to all activities, as Clause (a) of the policy refers to “*any resource consent granted under the region-wide rule*”. This includes a resource consent application for the discharge of stormwater under the region-wide rules in the LWRP.
877. Therefore, Policy 4.11 of PC5 is relevant to this application, and in particular the consent duration (if consent is granted). As PC5 is beyond challenge, substantial weight should be given to it.²⁵
878. The Christchurch-West Melton sub-regional section is currently scheduled in the LTP to be notified in 2022. The implications of this is further outlined in the ‘Duration’ Section below.

Waimakariri River Regional Plan

879. The provisions of the Waimakariri River Regional Plan (WRRP) apply to the Waimakariri River catchment. Although the Pūharakekenui/Styx River catchment is within the covered area, the WRRP was amended pursuant to Section 27 of the CER Act to specify that water quality in this catchment is to be managed by NRRP. Since the water quality sections of NRRP are now inoperative, the LWRP applies to the Pūharakekenui/Styx River catchment as the intent of the CER Act amendment was to ensure the most up to date provisions, including the requirement for Stormwater Management Plans are applied across Christchurch to facilitate a simpler earthquake recovery.
880. Chapter 6 Water Quality contains the only relevant objective and policies.
881. Objective 6.1 of the WRRP states:
- Enable present and future generations to gain cultural, social, recreational, economic, health and other benefits from the rivers, lakes and wetlands in the Waimakariri River Catchment while:*
- (a) *Safeguarding their existing value for efficiently providing sources of drinking water for people and their animals;*
 - (b) *Safeguarding the life-supporting capacity of the water, including its associated: aquatic ecosystems, significant habitats of indigenous fauna, and areas of significant indigenous vegetation;*
 - (c) *Safeguarding their existing value for providing mahinga kai for Tangata Whenua;*
 - (d) *Protecting wahi tapu and other wahi taonga of value to Tangata Whenua;*
 - (e) *Preserving the natural character of rivers, lakes and wetlands and protecting them from inappropriate use and development;*
 - (f) *Protecting outstanding natural features and landscapes from inappropriate use and development;*
 - (g) *Maintaining and enhancing amenity values; and*
 - (h) *Protecting the significant habitat of trout and salmon.*

²⁵ Under section 60(2)(a) of the Greater Christchurch Regeneration Act 2016, the decision-maker on this resource consent application must not make a decision that is inconsistent with the LPRP.

882. Further, Policy 6.1 of the WRRP states:

Set and maintain water quality standards for, and control the discharge of contaminants into, surface water bodies in the Waimakariri River Catchment as outlined in Figure 6 and defined in Map 2 to:

- (a) Protect the natural state of the water in lakes and rivers upstream of the confluence of the Waimakariri River with the Otukaikino Creek;*
- (b) Ensure water quality is suitable for drinking water for animals, contact recreation, fisheries, fish spawning, aquatic ecosystems and is not altered in those characteristics that have a direct bearing upon the aesthetic values of water or Tangata Whenua cultural values, in the mainstem of the Waimakariri River downstream of the confluence of the Waimakariri River with the Otukaikino Creek;*
- (c) Ensure water quality is suitable for drinking water for animals, fisheries, fish spawning, aquatic ecosystems and is not altered in those characteristics that have a direct bearing upon the aesthetic values of water, in the Kaiapoi River, Styx River, Otukaikino Creek downstream of the Groyne picnic area, and their tributaries; and*
- (d) Ensure that, in the Otukaikino Creek and its tributaries at, and upstream of, the Groyne picnic area:*
 - (i) Water quality is suitable for drinking water for animals, fisheries, fish spawning, and aquatic ecosystems;*
 - (ii) The natural water quality with respect to organisms of public health significance is maintained; and*
 - (iii) Water quality is suitable aesthetically and visually for contact, and other forms of, recreation."*

883. The Applicant is seeking to maintain the receiving environment water quality in the Otukaikino catchment. Although the water quality attribute levels have been chosen based on the LWRP, if these values are achieved it is likely the outcomes listed in Objective 6.1 would be met. As the Applicant is seeking to achieve water quality that meets the attribute values, I consider the proposal consistent with the above objective and policy.

Regional Coastal Environment Plan

884. The purpose of the RCEP is to promote the sustainable management of the natural and physical resources of the Coastal Marine Area and the coastal environment and to promote the integrated management of that environment. Chapter 7: Coastal Water Quality is relevant the CSNDC.

885. **Objective 7.1** of the RCEP states:

Enable present and future generations to gain cultural, social, recreational, economic, health and other benefits from the quality of the water in the Coastal Marine Area, while:

- (a) Maintaining the overall existing high natural water quality of coastal waters;*
- (b) Safeguarding the life-supporting capacity of the water, including its associated: aquatic ecosystems, significant habitats of indigenous fauna and areas of significant indigenous vegetation;*
- (c) Safeguarding, and where appropriate, enhancing its value for providing mahinga kai for Tangata Whenua;*
- (d) Protecting wahi tapu and wahi taonga of value to Tangata Whenua; (e) preserving natural character and protecting outstanding natural features and landscapes, where water quality is an aspect of their value, from reductions in water quality;*
- (f) Maintaining, and where appropriate enhancing, amenity values; and*

(g) *Recognising the intrinsic values of ecosystems and any finite characteristics of the coastal environment.*

886. The Applicant is seeking to manage stormwater discharges to ensure that the existing coastal water quality is maintained. There is currently little information to determine if stormwater discharges are affecting ecological health, or mahinga kai but the proposal should ensure that any effects do not worsen. On this basis I consider the proposal is likely to be consistent with this objective.

887. **Policy 7.1** of the RCEP states:

In areas where water quality classes for parts of the Coastal Marine Area have not been established in this plan, the granting of a resource consent to discharge a contaminant or water into water, or onto or into land in the Coastal Marine Area:

- (a) *Shall not unreasonably restrict existing lawful uses of the coastal water; and*
- (b) *Shall provide that, after reasonable mixing, the discharge shall not have any more than a minor adverse effect on the quality of the water existing prior to the granting of the resource consent.*

888. The discharges to coastal water from Parklands, Waimairi Beach and North New Brighton and at Sumner are into coastal water where water quality classes have not been established. As discussed above the Applicant intends to treat stormwater to at least maintain the existing coastal water quality and proposes improvements to the discharge quality, specifically TSS and heavy metals. On this basis, I consider that the proposal is consistent with this policy.

889. **Policy 7.2** of the RCEP states:

Establish water quality classes, set water quality standards and control the discharge of contaminants and water within the parts of the Coastal Marine Area defined in Schedule 5 that contain areas of degraded water quality or which need classifications to reflect existing or potential uses of the areas. [...]

890. The discharges into the Ihutai/Avon-Heathcote Estuary, Lyttelton Harbour and Akaroa Harbour are to coastal water where water quality classes have been set. As discussed above, the Applicant intends to treat stormwater to at least maintain the current coastal water quality. However, I also note that insufficient information is available at this stage to assess the proposal against the set water quality classes, and therefore consistency with this policy cannot be determined at this stage. Nonetheless, provided the recommended changes to the proposal are adopted by the Applicant, I consider that the proposal is likely to be consistent with this policy.

891. **Policy 7.4** of the RCEP states:

Before being granted a resource consent for a point source discharge of a contaminant or water into water, or onto or into land in the Coastal Marine Area in circumstances where the discharge, after reasonable mixing, would not achieve the water classification purposes for which the water quality standards set in this plan, the Applicant must satisfy Environment Canterbury:

- (a) *That exceptional circumstances justify the granting of the consent; or*
- (b) *That the discharge is of a temporary nature; or*
- (c) *That the discharge is associated with necessary maintenance work; or*
- (d) *That practicable alternatives to avoid such a discharge are not available.*

892. As discussed above, I also note that insufficient information is available at this stage to assess the proposal against the set water quality classes, and therefore consistency with this policy cannot be determined at this stage. Nonetheless, provided the recommended changes are adopted by the Applicant, I consider that the proposal is likely to be consistent with this policy.

893. **Policy 7.6** of the RCEP states:

In setting conditions on a resource consent to discharge a contaminant or water into water, or onto or into land in the Coastal Marine Area, a reasonable mixing zone should be determined by considering, amongst other matters, the following:

- (a) The volumes, contaminant loading and contaminant concentrations involved with the discharge;*
- (b) Factors such as sea conditions, tides, wave action, water depths, water velocity, and flushing characteristics that will normally affect the assimilative capacity of the receiving water and the dispersion of the contaminants or the discharge water;*
- (c) The presence of an Area of Significant Natural Value at the site or in close proximity;*
- (d) The existing use of the immediate area, including the presence of other discharges;*
- (e) If in any area within which a water quality standard is set, the size of the area in relation to the mixing zone; and*
- (f) The proximity of adjacent areas where water quality standards have been set; and*
- (g) The natural values of the receiving environment.*

894. As discussed above, Dr Bolton-Ritchie considers that detailed water quality sampling at sites in proximity to and with increasing distance away from stormwater outlets would be required to determine both the zone of impact and actual impact on water quality in proximity to stormwater outlets. I consider that consistency with this policy can be achieved provided the recommendations by Dr Bolton-Ritchie are adopted as conditions of the consent, if the CSNDC is granted.

895. **Policy 7.7** of the RCEP states:

Ensure that discharges of water or contaminants into water, or onto or into land in the Coastal Marine Area avoid significant adverse effects on cultural or spiritual values associated with sites, (e.g. areas covered by controls such as taiapure or mahinga mataitai), of special significance to the Tangata Whenua.

896. A taiāpure is located within Akaroa Harbour and a mātaítai is located near Rāpaki. The Applicant has proposed to manage discharges to maintain the marine cultural health index and State of the Takiwā scores. As discussed above, I understand that the Applicant has reached an agreement with Ngā Rūnanga. However, in absence of the comments required from Ngā Rūnanga on the proposal, I am unable to conclude whether or not the proposal is consistent with this policy.

897. **Policy 7.8** of the RCEP states:

After reasonable mixing, the discharge of a contaminant or water into water, or onto or into land in the Coastal Marine Area, (either by itself or in combination with the same, similar, or other contaminants or water) should not:

- (a) Give rise to any significant adverse effects on the existing habitats or feeding grounds of indigenous fauna or any significant adverse effects on aquatic ecosystems; and*
- (b) Have acute or chronic toxic effects on fish, either directly or indirectly as a result of an adverse effect on aquatic organisms.*

898. As discussed above, insufficient information is available to determine the actual effects of the stormwater network discharges on coastal water. The Applicant proposes to at least maintain coastal water quality, while also improving the

discharge quality and reducing the contaminant loads in water bodies. While in absence of further details on the stormwater effects no conclusion can be drawn on whether the proposal is consistent with this policy, I consider that the Adaptive Management Approach with the proposed SMP, EMP and improvements to achieve the set outcomes should ensure that it is not contrary to this policy.

Lyttelton Port Recovery Plan

Overview

899. The primary purpose of the Lyttelton Port Recovery Plan (LPRP) is to enable the recovery of the port following the 2010-2011 Canterbury Earthquake sequence. The LPRP directs changes to RMA plans, including the RCEP and LWRP to enable structures to be rebuilt as well as addressing new structures and activities.
900. Under section 60(2)(a) of the Greater Christchurch Regeneration Act 2016, the decision-maker cannot make a decision on this consent application that is inconsistent with the LPRP.
901. I have assessed the amendments to the RCEP made through the LPRP separately to allow for a holistic consideration of the CSNDC in the context of the port operations. I consider that the RCEP is the only plan relevant in the port area as all stormwater discharges will enter coastal water.

Regional Coastal Environment Plan Amendments

902. Objective 10.1 states:

The expedited recovery of Lyttelton Port, including its repair, rebuild and reconfiguration, is provided for as a matter of priority, while recognising the relationship with and managing any adverse effects of recovery activities on the ecological, recreational, heritage, amenity and cultural values of Whakaraupō/Lyttelton Harbour.

903. Policy 10.1.13 states:

Manage the quality of stormwater generated within the Operational Area of Lyttelton Port and discharged into the Coastal Marine Area, by ensuring that:

- (1) The formation or renewal of impervious surfaces, including wharf areas, is designed to capture and direct rainfall to a stormwater network; and*
- (2) Any stormwater network constructed or repaired during the formation or renewal of impervious surfaces shall include hydrocarbon interceptors and/or gross pollutant interceptors designed in accordance with best practice for the catchment it services; and*
- (3) The hydrocarbon interceptors and/or gross pollutant interceptors are to follow best practice design to capture the contaminants likely to be present in the stormwater associated with the cargo types being handled in an area; and*
- (4) As far as practicable, cargo is handled on wharves or hard standing areas that contain hydrocarbon interceptors and/or gross pollutant interceptors designed for that type of cargo; and*
- (5) Any earthworks carried out during the construction and repair works are appropriately managed to avoid the discharge of sediment into the Coastal Marine Area.*

904. Stormwater from within the Port's operational area will be managed by LPC and will not form part of the CSNDC network discharge. However, it is understood that some operational areas of the Port discharge to the CCC network, and these discharges would therefore form part of the CSNDC should

the discharges be authorised by CCC. Alternatively, a separate discharge permit may be required for discharges not authorised under the CSNDC (if granted).

905. In general, I consider that the proposal is not inconsistent with the LPRP, as the CSNDC (if granted) is unlikely to have any implications on the Port's stormwater management practices outlined in the above policy.

Christchurch District Plan

906. **Objective 3.3.6** of the CDP states:

- (a) *New subdivision, use and development (other than new critical infrastructure or strategic infrastructure to which paragraph b. applies): [...]*
- (i) *[...] is undertaken in a manner that ensures the risks of natural hazards to people, property and infrastructure are appropriately mitigated.*

907. I consider that the proposal is consistent with this policy as the Applicant intends to reduce the adverse effects of flooding, whereby discharges from new development shall not exceed the pre-development peak flows.

908. **Objective 3.3.12** of the CDP states:

- (a) *The social, economic, environmental and cultural benefits of infrastructure, including strategic infrastructure, are recognised and provided for, and its safe, efficient and effective development, upgrade, maintenance and operation is enabled; and*
- (b) *Strategic infrastructure, including its role and function, is protected by avoiding adverse effects from incompatible activities, including reverse sensitivity effects, by, amongst other things: [...]*
 - (i) *Managing the risk of bird strike to aircraft using Christchurch International Airport; and [...]*
- (c) *The adverse effects of infrastructure on the surrounding environment are managed, having regard to the economic benefits and technical and operational needs of infrastructure.*

909. CIAL lodged a submission in regard to the potential for stormwater infrastructure to increase the risk of bird strike at the Christchurch International Airport. To address this matter, I have recommended a condition that requires stormwater treatment facilities constructed within three kilometres of the airport to be designed to minimise bird strike. On this basis, I consider that the proposal is consistent with this objective.

910. **Objective 3.3.17** of the CDP states:

- (a) *The critical importance of wai (water) to life in the District, including surface freshwater, groundwater, and Te Tai o Mahaanui (water in the coastal environment) is recognised and provided for by:*
 - (i) *Taking an integrated approach to managing land use activities that could adversely affect wāi (water), based on the principle of 'Ki Uta Ki Tai' (from the mountains to the sea);*
 - (ii) *Ensuring that the life supporting and intrinsic natural and cultural values and characteristics associated with water bodies and coastal waters, their catchments and the connections between them are maintained, or improved where they have been degraded;*
 - (iii) *Ensuring subdivision, land use and development of land is managed to safeguard the District's potable wai (water) supplies, waipuna (springs), and water bodies and coastal waters and their margins; particularly Ōtākaro (Avon River), Ihutai (Avon-Heathcote Estuary), Whakaraupō (Lyttelton Harbour), Whakaroa (Akaroa Harbour) and Te Tai o Mahaanui;*

- (iv) *Ensuring that Ngāi Tahu values and cultural interests in wai (water) as a taonga are recognised and protected.*

911. The stormwater discharges are proposed to be managed in an integrated way, the Applicant proposes to improve discharge quality, and land use is generally proposed to be managed to safeguard the District's water bodies, coastal waters and groundwater sources. However, as discussed above, I am unable to draw a conclusion on the effects of the stormwater discharges on cultural values, and while the proposal is not contrary to this objective, it cannot be determined whether it is fully consistent with it.

912. **Policy 8.2.3.4** of the CDP states:

(a) *District wide:*

- (i) *Avoid any increase in sediment and contaminants entering water bodies as a result of stormwater disposal.*
- (ii) *Ensure that stormwater is disposed of in a manner which maintains or enhances the quality of surface water and groundwater.*
- (iii) *Ensure that any necessary stormwater control and disposal systems and the upgrading of existing infrastructure are sufficient for the amount and rate of anticipated runoff.*
- (iv) *Ensure that stormwater is disposed of in a manner which is consistent with maintaining public health.*

(b) *Outside the Central City:*

- (i) *Encourage stormwater treatment and disposal through low-impact or water-sensitive designs that imitate natural processes to manage and mitigate the adverse effects of stormwater discharges.*
- (ii) *Ensure stormwater is disposed of in stormwater management areas so as to avoid inundation within the subdivision or on adjoining land.*
- (iii) *Where feasible, utilise stormwater management areas for multiple uses and ensure they have a high quality interface with residential activities or commercial activities.*
- (iv) *Incorporate and plant indigenous vegetation that is appropriate to the specific site.*
- (v) *Ensure that realignment of any watercourse occurs in a manner that improves stormwater drainage and enhances ecological, mahinga kai and landscape values.*
- (vi) *Ensure that stormwater management measures do not increase the potential for birdstrike to aircraft in proximity to the airport.*
- (vii) *Encourage on-site rain-water collection for non-potable use.*
- (viii) *Ensure there is sufficient capacity to meet the required level of service in the infrastructure design standard or if sufficient capacity is not available, ensure that the effects of development are mitigated on-site.*

913. For the reasons discussed above, I consider that consistency of the CSNDC proposal with this policy can be achieved provided the recommended changes to the proposed conditions are adopted by the Applicant.

914. **Policy 5.2.2.1.4** of the CDP states:

- (a) *Ensure that subdivision, use and development (including proposals for hazard mitigation works or hazard removal) do not transfer or create unacceptable natural hazard risk to other people, property, infrastructure or the natural environment.*

915. As discussed above, the Applicant intends to reduce the adverse effects of flooding, whereby discharges from new development shall not exceed the pre-development peak flows. The CSNDC proposal is therefore consistent with this policy.

OTHER RELEVANT MATTERS

Overview

916. With regards to Section 104(1)(c), the consent authority can consider any other matter relevant and reasonably necessary to determine the application. I consider that other matters that the Commissioners may wish to consider include:
- a. Te Rūnanga o Ngāi Tahu Freshwater Policy;
 - b. The Mahaanui Iwi Management Plan 2013;
 - c. The Canterbury Water Management Strategy;
 - d. Land Use Recovery Plan 2013; and
 - e. Central City Recovery Plan.

Te Rūnanga o Ngāi Tahu Freshwater Policy Statement

917. The Te Rūnanga o Ngāi Tahu Freshwater Policy Statement (NTFPS) describes the association of Te Rūnanga o Ngāi Tahu with freshwater resources, the ways in which Ngāi Tahu, as tangata tiaki, want to participate in freshwater management and the environmental outcomes sought.
918. I consider the relevant objectives and policies of the NTFPS are:
- Objective 6.1 – *To afford total protection to waters that are of particular spiritual significance to Ngāi Tahu.*
- Policy 1 – *Identify sites for immediate protection because of their significance as wāhi tapu.*
- Objective 6.2 – *Restore, maintain and protect the mauri of freshwater resources.*
- Policy 3 – *Adopt catchment management planning as one of the means of achieving integrated management.*
- Policy 4 – *Protect the opportunities for Ngāi Tahu's uses of freshwater resources in the future.*
- Objective 6.3 – *To maintain vital, healthy mahinga kai populations and habitats capable sustaining harvesting activity.*
- Policy 2 – *Restore and enhance mahinga kai values of lakes, rivers, streams, wetlands, estuaries and riparian margins.*
- Objective 6.4 – *To promote collaborative management initiatives that enable the active participation of Ngāi Tahu in freshwater management.*
- Policy 3 – *Facilitate effective Ngāi Tahu participation in*
- *Policy formulation;*
 - *Decision making;*
 - *Operational management activities; and*
 - *Monitoring activities.*
919. In general, the Applicant has consulted and reached an agreement with Ngā Rūnanga, who will be involved in implementation of the CSNDC. On this basis, I consider that the Applicant has had regard to the resource management issues described in the NTFPS.

Mahaanui Iwi Management Plan 2013

920. The Mahaanui Iwi Management Plan 2013 (MIMP) is a non-statutory planning document that reflects the collective efforts of six Papatipu Rūnanga that hold

manawhenua rights over lands and waters within the takiwā from the Hurunui River to the Hakatere River and inland to Kā Tiritiri o Te Moana.

921. The Applicant has assessed the MIMP in Section 6.6 of the application and states that there is general alignment between the CSNDC and iwi management plan. The CSNDC supports policies in relation to:
- a. Integrated catchment management planning;
 - b. Installation of treatment devices which utilise land as a treatment method;
 - c. Reducing the impacts of urban development to protect water quality, significant sites and mahinga kai.
922. The Applicant acknowledges that the CSNDC is in conflict with the policies regarding:
- a. Areas where untreated stormwater will enter waterways and coastal water;
 - b. The CSNDC being a 'global' resource consent; and
 - c. The duration requested being greater than 15 years.
923. The Applicant considers that these conflicts are somewhat alleviated by the proposed consent conditions and the commitment to engage with Papatipu Rūnanga in the development and implementation of SMPs.
924. I consider that the relevant policies of the MIMP are:
- WM6.1 To require improvement of water quality in the takiwā is recognised as a matter of regional and immediate importance.*
 - W6.2 To require that water quality in the takiwā is of a standard that provides for the relationship of Ngāi Tahu to freshwater...*
 - WM6.8 To continue to oppose the discharge of contaminants to land where contaminants may enter water*
 - WM6.9 To require local authorities to eliminate existing discharges of contaminants to waterways, wetlands and springs in the takiwā, including treated sewage, stormwater and industrial waste, as a matter of priority.*
 - WM6.16 To require, in the first instance, that all potential contaminants that may enter water (e.g. nutrients, sediments and chemicals) are managed on site and at source rather than discharged off site. This applies to both rural and urban activities.*
 - WM10.1 In principle, the unnatural mixing of water from different sources between or within catchments is culturally inappropriate.*
 - WM13.5 To advocate, where appropriate, for the creation of wetland areas to assist with the management of onsite/site sourced stormwater [...] to utilise the natural capacity of these ecosystems to filter contaminants. These wetlands must be constructed wetlands; natural wetlands are not be used to treat or dispose of [contaminants]. However, they may be adjacent to natural wetlands to mitigate the impacts on natural ecosystems.*
 - P6.1 To require on-site solutions to stormwater management in all new urban, commercial, industrial and rural developments (zero stormwater discharge of site) based on a multi tiered approach to stormwater management [...]*

- P6.2 To require that the incremental and cumulative effects of stormwater discharges are recognised and provided for in local authority planning and assessments.*
- P6.5 To encourage the design of stormwater management systems in urban and semi urban environments to provide for multiple uses: for example, stormwater management infrastructure as part of an open space network that provides for recreation, habitat and customary use values.*
- P6.5 To support integrated catchment management plans (ICMP) as a tool to manage stormwater and the effects of land use change and development on the environment and tāngata whenua values, when these plans are consistent with Policies 6.1 to 6.4.*
- P6.6 To oppose the use of global consents for stormwater discharges.*
- P8.1 To require that discharge to land activities in the takiwā:*
- (a) Are appropriate to the soil type and slope, and the assimilative capacity of the land on which the discharge activity occurs;*
 - (b) Avoid over-saturation and therefore the contamination of soil, and/or run of and leaching; and*
 - (c) Are accompanied by regular testing and monitoring of one or all of the following: soil, foliage, groundwater and surface water in the area.*
- P8.2 In the event that accumulation of contaminants in the soil is such that the mauri of the soil resource is compromised, then the discharge activity must change or cease as a matter of priority.*
- TAN2.1 To require that coastal water quality is consistent with protecting and enhancing customary fisheries, and with enabling tangata whenua to exercise customary rights to safely harvest kaimoana.*
- TAN2.2 To require the elimination of direct wastewater, industrial, stormwater and agricultural discharges into the coastal waters as a matter of priority.*
- TAN2.3 To oppose the granting of any new consents enabling the direct discharge of contaminants to coastal water, or where contaminants may enter coastal waters.*
- TAN 2.4 To ensure that economic costs are not allowed to not take precedence over the cultural, environmental and intergenerational costs of discharging contaminants to the sea.*
- IH3.1 To improve water quality in the Ihutai catchment by consistently and effectively advocating for a change in perceptions of waterways: from public utility to wāhi taonga.*
- IH3.2 To require that waterways and water bodies (including Te Ihutai) are managed to achieve and maintain a water quality standard consistent with food gathering.*
- IH3.3 To require that local authorities eliminate sources of contaminants to waterways in the Ihutai catchment, primarily [...]*
- (b) Stormwater discharges into all waterways, including small headwater and ephemeral streams, and drains, runoff into waipuna and discharges to Te Oranga (Horseshoe Lake).*
- IH5.1 To require that the waipuna in the catchment are recognised and managed as wāhi taonga, as per general policy on wetlands, waipuna and riparian margins, with particular attention to ensuring that waipuna are protected from the discharge of contaminants...*
- WH1.2 To require that Whakaraupō is managed for mahinga kai first and foremost. This means [...]*

(b) *water quality in Whakaraupō is consistent with the protecting mahinga kai habitat and enabling customary use (whole of harbour not just designated areas).*

A5.1 *To support the development of an integrated catchment management plan (ICMP) for Akaroa Harbour to address water quality and quantity issues in the catchment [...].*

A5.3 *To improve water quality in the Akaroa Harbour using the methods identified in the general policies on Water quality [...], with particular focus on:*

(a) *eliminating existing discharges on pollutants; [...]*

(b) *Requiring appropriate controls on land use to control sedimentation; [...]*

925. I agree that the CSNDC supports some of the policies above but may be inconsistent with others. In absence of CIAs for all catchments, it is not possible for me to reach a conclusion on whether or not the proposal is consistent or inconsistent with, or even contrary to, the above MIMP policies.

Canterbury Water Management Strategy

926. The Canterbury Water Management Strategy (CWMS) is a non-statutory document which provides the framework for land and water management for the region. It was developed through an extensive collaborative process and is endorsed by all councils in Canterbury. In 2005 the Canterbury Mayoral Forum took ownership of the CWMS to address the increasing water demand in the region, which was leading to problems in sourcing, storage, allocation of water and environmental effects. The desired outcome of the CWMS is

To enable present and future generations to gain the greatest social, economic, recreational and cultural benefits from our water resources within an environmentally sustainable framework.

927. The CWMS divides Canterbury into ten water management zones, each with their own zone committee which, together with their communities and stakeholders, have set targets for the following areas:

- a. Drinking water;
- b. Irrigated land area;
- c. Environmental limits;
- d. Energy security and efficiency;
- e. Ecosystem health/biodiversity;
- f. Water use efficiency;
- g. Kaitiakitanga;
- h. Regional and national economic growth;
- i. Natural character of braided rivers; and
- j. Recreational and amenity opportunities.

928. The CCC's jurisdiction spans three CWMS zones, Christchurch-West Melton, Banks Peninsula and Selwyn–Te Waihora. Each zone has a specific Zone Implementation Programme (ZIP), which identifies recommendations for water management to achieve the CWMS targets.

929. The Christchurch-West Melton ZIP priority outcomes relevant to the stormwater network discharges are:

- GW1: *Groundwater quality is safeguarded for multiple uses;*
- GW2: *The quality of untreated drinking water from aquifers is safeguarded;*
- GW4: *Water levels, quality and flows at spring-heads of spring-fed waterways are safeguarded;*
- RR4: *Any adverse effects of flood management activities and other infrastructure in or near waterways, on the safety of water based recreation are reduced and eliminated where possible.*
- SW1: *Surface water quality and flows are improved;*
- SW2: *Mahinga kai are safeguarded from declining quality and flows;*
- SW3: *The Waimakariri River is safeguarded from declining water quality and flows;*
- SW4: *Stormwater impacts on surface water quality are reduced;*
- EB1: *Ecological health of all waterways is protected and rehabilitated;*
- EB3: *Effects of flood management activities on waterway biodiversity are minimised; and*
- EB9: *The Avon-Heathcote Estuary/Ihutai ecosystems are more effectively protected.*

930. The Banks Peninsula ZIP recommendations relevant to stormwater are:

- 1.2: *Ki Uta Ki Tai (catchment based planning from the mountains to the sea) to be integrated into all planning documents on the Peninsula.*
- 1.3: *The coast, oceans and harbours not to be separated from the waterways leading to them.*
- 1.4: *All Papatipu Rūnanga to be consulted and involved in the freshwater projects in their Takiwā.*
- 2.5: *All stormwater to be controlled off hazardous sites with oil interceptors or similar technology.*
- 2.6: *Stormwater catchment upgrades to be prioritised based on effects of water quality and quantity on the environment.*
- 5.2: *Priority for erosion and sediment control information to be readily available to roading planners and engineers building and maintaining roading cuts, fill batters and associated works.*
- 5.3: *Enforcement to be prioritised for erosion and sediment discharge from roads on the Peninsula.*
- 5.4: *Subdivisions, new housing earthworks and quarries to be managed in construction and operational maintenance phases in accordance with strict erosion and sediment control guidelines to eliminate sediment discharge during, and after, rain events.*
- 5.5: *Christchurch City Council to prioritise Whakaraupō for an integrated stormwater management plan.*
- 5.6: *To prevent sediment discharge from exposed soil, stabilising vegetation to be established as a priority after any earthworks.*
- 5.8: *The effects of potential extreme events as a result of climate change to be included in the evaluation of erosion and sediment control guidelines.*
- 6.7: *The lake and surrounding streams to be managed in such a way that flooding is minimised to a "1 in 100 year level" to Little River and SH1.*
- 8.2: *Statutory Planning processes take into account the IPCC predictions of 10% higher rainfall events resulting in flooding and increased risk of slope instability.*
- 8.3: *Statutory Planning processes take into account the prediction of sea level rise leading to possible 50-80cm rise by 2090.*
- 8.5: *Climate Change effects to be taken into account when culverts are designed and constructed, maintained or replaced.*

931. The Selwyn-Waihora ZIP recommendations relevant to stormwater are:
- 1.15: *Support the innovative treatment of residential stormwater such as the creation of artificial wetlands; and*
 - 3.4: *Identify and protect the permanent sources of lowland streams.*
932. Although the CWMS and relevant ZIPs discussed above are non-statutory documents, extensive consultation is carried out by the zone committees in developing the ZIP and the ZIPs set out the community outcomes for each zone. I consider that the ZIPs are relevant and reasonably necessary to determine the application and are a matter that should be considered under section 104(1)(c) of the RMA. For the reasons outlined in the sections above, I consider that the proposal will generally give effect to the above ZIP outcomes and recommendations provided the recommended changes to the proposal are adopted by the Applicant.

Land Use Recovery Plan 2013

933. The Land Use Recovery Plan 2013 (LURP) is a statutory document prepared under the Canterbury Earthquake Recovery Act 2011 it took effect in December 2013. Its purpose is to provide for residential and business land use to support recovery and rebuilding to 2028.
934. Section 3.3. of the LURP establishes actions to meet the outcomes sought by this plan. The key outcomes with regard to this application are:
- 1. *A clear planning framework directs where and how new development should occur so that it integrates efficiently and effectively with infrastructure programmes and avoids key hazards and constraints.*
 - 4. *RMA plans and regulatory processes enable rebuilding and development to go ahead without unnecessary impediments.*
 - 5. *A supportive and certain regulatory environment provides investor confidence to obtain the best outcomes from resources used in the recovery.*
935. While the LURP is generally considered to be of limited relevance to the CSNDC proposal, I note that to the extent that it is relevant, the application is not inconsistent with the above key outcomes.

Christchurch Central Recovery Plan

936. The Christchurch Central Recovery Plan (CCRP) was written after the 2011 earthquakes to set out the vision for central Christchurch. It defines the form of the central city, sets out the locations of key anchor projects needed to optimise recovery, and outlines block plans which show what the city could look like in the future.
937. The objectives of the CCRP generally support programmes to improve water quality, to protect and enhance springs and waterways, and to improve stormwater treatment and to manage stormwater in ways that support cultural values.
938. While the CCRP is generally considered to be of limited relevance to the CSNDC proposal, I note that to the extent that it is relevant, the application is not inconsistent with the plan.

PART 2 MATTERS

Overview

939. Under Section 104(1) of the RMA, a consent authority must consider applications "*subject to Part 2*" of the RMA, specifically Sections 5, 6, 7 and 8.
940. The High Court in *R J Davidson Family Trust v Marlborough District Council* found that when consent authorities are considering resource consent applications under Section 104 of the RMA, they can only resort to Part 2 of the RMA if the relevant statutory planning documents are invalid, incomplete or uncertain.²⁶
941. This decision was subject to an appeal to the Court of Appeal, which found recently that:
- a. Decision makers must consider Part 2 when making decisions on resource consent applications, where it is appropriate to do so. The extent to which Part 2 of the RMA should be referred to depends on the nature and content of the planning documents being considered.
 - b. Where the relevant planning documents have been prepared having regard to Part 2 of the RMA, and with policies designed to achieve clear environmental outcomes, consideration of Part 2 is not ultimately required. In this situation, the policies of these planning documents should be implemented by the consent authority. The consideration of Part 2 "*would not add anything to the evaluative exercise*" as "*genuine consideration and application of relevant plan considerations may leave little room for Part 2 to influence the outcome*". However, the consideration of Part 2 is not prevented, but Part 2 cannot be used to subvert a clearly relevant restriction or directive policy in a planning document.
 - c. Where it is unclear from the planning documents whether consent should be granted or refused, and the consent authority has to exercise a judgment, Part 2 should be considered.
 - d. If it appears that the relevant planning documents have not been prepared in a manner that reflects the provisions of Part 2, the consent authority is required to consider Part 2.
942. In summary, while the Court of Appeal ultimately declined to overturn the High Court decision in the case of *R J Davidson Family Trust v Marlborough District Council* (because it found the error was not material to the High Court's decision), it found the High Court made an error by finding that consideration of Part 2 was not required or not available when considering the resource consent application.
943. I also note that the Environment Court found recently that the *R J Davidson* decision was made in a context where there was only an operative plan in place, while with regard to a proposed plan the Court held that the existence of an untested proposed plan made it necessary to consider a resource consent application with reference to Part 2.²⁷

²⁶ *R J Davidson Family Trust v Marlborough District Council* [2017] NZHC 52 (applying the reasoning in the decision of the Supreme Court in *Environmental Defence Society Inc v The New Zealand King Salmon Co Ltd* [2014] NZSC 38).

²⁷ *Skyline Enterprises Limited v Queenstown Lakes District Council* [2017] NZEnvC 124.

944. The LWRP, WRRP and RCEP are all operative plans. However, proposed Plan Change 5 to the LWRP (PC5) seeks, among changes to the approach to nutrient management and farming land use impacts, changes to the region-wide Policy 4.11. PC5 is currently beyond challenge but is not yet operative.
945. I also note that Section 6(h) of the RMA (management of significant risks from natural hazards) was inserted by the Resource Legislation Amendment Act 2017, and therefore has not been considered specifically in the preparation of the relevant regional plans. Section 6(g) was replaced in 2011 by the Marine and Coastal Area (Takutai Moana) Act 2011, and therefore has not been considered specifically in the RCEP.
946. While I do not consider any of the operative regional plans to be invalid, the plans predate the 2017 RMA amendments, and therefore there is some uncertainty around whether or not these plans appropriately reflect the inclusion of Section 6(h) in Part 2 of the RMA.
947. On the basis of the above, I am of the opinion that consideration of the proposal under Part 2 of the RMA is appropriate and required.

Matters of National Importance (Section 6)

948. The Matters of National Importance, which all persons exercising functions and powers under the RMA shall recognise and provide for, are set out in Section 6 of the RMA.
949. I consider the following Matters of National Importance are relevant to the CSNDC proposal:
- (a) *The preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development;*
 - (c) *The protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna;*
 - (e) *The relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga;*
 - (g) *The protection of recognised customary activities;*
 - (h) *The management of significant risks from natural hazards.*
950. In general, I am of the opinion that the natural character of the receiving environments can be preserved provided the recommendations made throughout this report are adopted by the Applicant. If more certainty is provided around the mitigation measures and timeframes to achieve the Receiving Environment Objectives and Targets, I consider that the receiving environments can be adequately protected.
951. As discussed above, the Applicant proposes to improve the discharge quality over the duration of the resource consent, which should help in reducing the adverse effects of stormwater discharges on the water quality of the receiving environments. This should assist in protecting existing areas of significant indigenous vegetation and significant habitats of indigenous fauna.
952. The Applicant has consulted with Ngā Rūnanga and taken into account the relationship of Tangata Whenua with water, wāhi tapu and other taonga.
953. The Applicant also seeks to manage the risk from flooding as a result of the stormwater network discharges.

954. Overall, I consider that the proposal recognises and provides for the relevant Matters of National Importance.

Other Matters (Section 7)

955. In achieving the purpose of the RMA, all persons exercising functions and powers under the RMA are directed to have particular regard to the matters listed in Section 7 of the RMA.
956. I consider the following relevant to the CSNDC proposal:
- (a) *Kaitiakitanga:*
 - (aa) *The ethic of stewardship:*
 - (b) *The efficient use and development of natural and physical resources:*
 - (c) *The maintenance and enhancement of amenity values:*
 - (d) *Intrinsic values of ecosystems:*
 - (f) *Maintenance and enhancement of the quality of the environment:*
 - (g) *Any finite characteristics of natural and physical resources:*
 - (h) *The protection of the habitat of trout and salmon:*
 - (i) *The effects of climate change:*
957. The matters of amenity values, ecosystems and water quality, including the habitat of trout and salmon, and quality of the environment have been given particular regard. I consider that adverse effects on these matters can generally be managed in a sustainable way, provided the changes recommended above are adopted by the Applicant.
958. The efficient use and development of natural and physical resources and their finite characteristics were also given particular regard in setting limits and the proposal to improve water quality throughout the district.
959. Kaitiakitanga and the ethic of stewardship have been given particular regard in the assessment of effects on cultural values, development of the Cultural Impact Assessments for the SMPs and through the on-going consultation undertaken and engagement as part of the resource consent conditions. CCC highlighted that it is committed to an on-going partnership with the Papatipu Rūnanga.
960. Particular regard has also been given to climate change and in particular the effects of predicted sea level rise on potential flood risk.
961. Overall, provided the recommended changes are adopted by the Applicant, I consider that the proposal will generally reduce the impacts of stormwater discharges on the existing environment.

Principles of the Treaty of Waitangi (Section 8)

962. Section 8 of the RMA requires the consent authority to take into account the principles of the Treaty of Waitangi (Te Tiriti o Waitangi).
963. The Court of Appeal has identified four principles, which form the basis of developing a relationship of partnership and communication. These are the principles of Essential Bargain, Tribal Self-Regulation, Treaty Relationship and Active Protection. The third principle, the Treaty Relationship, accords Maori with special status as a Treaty Partner, distinct and separate from status as an 'affected party'.
964. The Mahaanui Iwi Management Plan 2013 (MIMP) identifies water quality and quantity as key principles to protect cultural values such as mauri and mahinga

kai that are critical to identity, sense of place and cultural well-being. The stormwater network discharges have the potential to adversely affect these values.

965. Te Papatipu Rūnanga and Te Rūnanga o Ngāi Tahu were advised of the lodgement of this application and have been consulted with throughout the application.
966. By addressing the relevant objectives and policies in the non-statutory iwi planning documents described above, I consider that the principles of the Treaty of Waitangi have been taken into account.
967. Again, I note that CCC highlights its commitment to a continued partnership with Papatipu Rūnanga to achieve the outcomes for the values of the affected environments. This includes further CIAs for new SMPs, involvement in the design and installation of treatment facilities as well as monitoring and reporting.
968. Overall, I consider that the Applicant has taken into account the principles of the Treaty of Waitangi.

Purpose of the RMA (Section 5)

969. The purpose of the RMA, as set out in Section 5(1), is to “*promote the sustainable management of natural and physical resources*”.
970. The purpose is to be achieved by the guidance provided by the Principles of the RMA (i.e. Sections 6, 7 and 8).
971. Section 5(2) of the RMA states that:
- In this Act, **sustainable management** means managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural wellbeing and for their health and safety while—*
- (a) *Sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and*
- (b) *Safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and*
- (c) *Avoiding, remedying, or mitigating any adverse effects of activities on the environment.*
972. In summary, sustainable management means managing resources in a way that enables people and communities to provide for their social, economic, and cultural wellbeing and for their health and safety, while achieving specified bottom line environmental outcomes.
973. For the reasons discussed above, in terms of Section 5(a) of the RMA, I consider the proposal will contribute to the sustainable management of the reticulated stormwater networks as physical resources and the receiving environments as natural resources and will sustain the potential of these resources to meet the reasonably foreseeable needs of future generations.
974. In achieving Section 5(1) of the RMA, Section 5(2)(b) and (c) of the RMA requires achieving Section 5(2) while, (b) safeguarding the life supporting capacity of air, water, soil, and ecosystems; and (c) avoiding, remedying, or mitigating any adverse effects of activities on the environment.
975. Based on the assessment of actual or potential effects of the proposal on the environment above and the proposed mitigation measures, I consider That the

proposal seeks to safeguard the life supporting capacity of water, soil and ecosystems by improving discharge quality and water quality in the receiving environments, and by providing measures to avoid, remedy or mitigate potential adverse effects of the stormwater discharges on the environment, therefore providing consistency with Sections 5(2) (b) and (c) of the RMA, respectively.

976. Having considered Part 2 of the RMA, I am of the opinion that the proposal will achieve the purpose of the RMA.

CONSIDERATION OF APPLICATION

Section 104D – Particular Restrictions for Non-complying Activities

977. Section 104D of the RMA sets out particular restrictions for non-complying activities and provides that a consent authority may only grant a resource consent for a non-complying activity if it is satisfied that either of the tests provided for in Sections 104D(1)(a) or (b) are met.
978. Section 104D of the RMA requires that either the adverse effects of an activity on the environment will be minor (Section 104D(1)(a)), or a proposed activity will not be contrary to the objectives and policies of the relevant proposed plan and/or plan (Section 104D(1)(b)).
979. Section 104D(1)(a) and (b) have been described by the Environment Court as the 'gateway' test. If neither gateway is satisfied, an application must be declined. However, if the application satisfies either gateway, then the application is considered under Section 104 of the RMA.
980. The Applicant concluded that the adverse effects of the activity on the environment will be minor, and that the CSNDC provides for many positive effects including the maintenance and improvement of water quality overtime and ensuring there is no significant increase in the adverse effects of flooding. The Applicant also concludes that the activity will not be contrary to the relevant planning provisions, and therefore the gateway tests are both met.
981. With respect to Section 104D(1)(a), I note that the adverse effects of the proposed non-complying activity stormwater discharges on the environment in terms of freshwater and coastal water quality have the potential to be more than minor, whereas no conclusion can be drawn as to whether Ngā Rūnanga are adversely affected by the proposal.
982. With respect to Section 104D(1)(b), the relevant objectives and policies have been assessed in the 'Objectives and Policies' Section above. Case law has determined that a proposal is 'not contrary to' objectives and policies if it is not 'repugnant to' or 'opposed to' the relevant objectives and policies taken as a whole (i.e. objectives and policies in plans need to be read collectively).²⁸ Where there is a conflict between objectives and policies, the specific provisions should be preferred over the general ones.
983. In my view, the objectives and policies of the LWRP, the WRRP and the RCEP seek to achieve the following key outcomes in relation to stormwater discharges:
- a. Integrated management of stormwater network discharges;

²⁸ *NZ Rail Ltd v Marlborough DC* [1994] NZRMA 70 (HC) and *Monowai Properties Ltd v Rodney DC* A215/03.

- b. Improvement of the quality of stormwater discharges to reduce the impacts of these discharges on the receiving environments and cultural values; and
 - c. No exacerbation of flooding effects.
- 984. The proposal, as put forward by the Applicant, is inconsistent with some of the relevant objectives and policies of the relevant plans. However, for the reasons outlined above I consider that if the recommended changes to the proposal are adopted by the Applicant, the proposal would, in my view, be consistent with the above outcomes
- 985. Therefore, I consider that, subject to adopting the recommendations discussed throughout this report, the proposed stormwater discharges meet the gateway test of being not contrary to the objectives and policies of the relevant proposed plan and/or plan, and therefore the application can be considered on its merits.

Section 104 – Consideration of Applications

- 986. Section 104(1) of the RMA describes what a consent authority consent authority must, subject to Part 2, have regard to when considering an application for resource consent.
- 987. With regard to Section 104(1)(a) of the RMA, the Applicant concluded that the adverse effects of the activity on the environment will be minor, and that the CSNDC provides for many positive effects including the maintenance and improvement of water quality overtime and ensuring there is no significant increase in the adverse effects of flooding.
- 988. The CRC review of the information and assessments provided by the Applicant determined that some of the adverse effects on the environment are minor and others are more than minor (i.e. effects on freshwater and coastal water quality). However, provided the recommendations are included on the resource consent (if granted), I consider that the effects are likely to be progressively reduced as a result of the measures proposed under the CSNDC, although it is uncertain as to whether the Applicant will be able to reduce the effects to a degree that would be minor and in what timeframe that would occur.
- 989. Section 104(1)(ab) of the RMA requires a consent authority to have regard to:

Any measure proposed or agreed to by the applicant for the purpose of ensuring positive effects on the environment to offset or compensate for any adverse effects on the environment that will or may result from allowing the activity.
- 990. The Applicant considers that managing the stormwater network discharges via the CSNDC through the implementation of SMPs and supported by a robust monitoring programme provides a management method that ensures funding will be prioritised based on need. The positive effects of implementing stormwater mitigation will primarily be evident in the natural environment. The health of waterways, estuary and coastal environment will improve as a result of a net reduction in contaminant load. The improved health of the receiving environments will also serve to improve the cultural, amenity and recreation values for local residents. The built environment will also benefit from reduced flood risk. The stormwater network also provides for economic development in Christchurch.
- 991. The Applicant concludes that actual and potential effects are minor or less than minor when assessed against the relevant planning provisions and taking into account the existing environment. However, I note that the Applicant has not established that there are unusual circumstances to justify that the expired

interim 'global' resource consent CRC090292 forms part of the 'existing environment'. Regardless of whether unusual circumstances can or cannot be established, I am of the opinion that in relation to the receiving surface water environments, additional discharges of stormwater are likely to have more than minor adverse effects. Therefore, the effects of the stormwater discharges on surface water quality should be considered as more than minor, although I note that measures are proposed to progressively reduce the effects of the discharges on the receiving environments over time.

992. In accordance with Section 104(1)(b) of the RMA, I have, subject to Part 2 of the RMA, had regard to all relevant objectives and policies for this application. As discussed under Section 104 of the RMA, I consider that while this application is inconsistent with some of the relevant objectives and policies of the relevant planning provisions it is not contrary to the them.
993. As discussed above, while the Applicant has proposed to work towards achieving the Receiving Environment Objectives and Targets set in the proposed conditions, there is currently too much uncertainty around the mitigation to be implemented and the timeframe over which these objectives and targets will be achieved. However, I am of the opinion that the proposal will be able to achieve the purpose of the RMA if the recommendations made throughout this report are adopted by the Applicant. I also note that there is some level of confidence in the proposed adaptive management approach, which will enable the modification of mitigation options based on monitoring and modelling data to address environmental effects.
994. In accordance with Section 104(1)(c), I have had regard to any other matters relevant to this application, including the cultural policy (and IMPs) and the CWMS. I consider this application is not inconsistent with the outcomes and recommendations of the ZIPs. However, with regards to the cultural policy framework, while I consider that the Applicant has had regard to the resource management issues described in the NTFPS and MIMP, the CSNDC supports some of the cultural policies but is likely inconsistent with others. In absence of CIAs for all catchments, I am unable to reach a conclusion on whether the proposal is consistent with the relevant cultural policy. However, I also point out that CCC have reached an agreement with Ngā Rūnanga on the CSNDC proposal. As discussed above, I consider that the proposal will generally give effect to the ZIP outcomes and recommendations provided the recommended changes are adopted by the Applicant. On this basis, I am of the opinion that other relevant matters were had regard to, and therefore the requirements under Section 104(1)(c) have been satisfied.
995. I consider that Section 104(2A) of the RMA is also relevant to the CSNDC application. I have had regard to the CCC's investment in the existing stormwater infrastructure.

Section 105 – Matters Relevant to Certain Applications

996. In accordance with Section 105(1), I have had regard to:
- (a) The nature of the discharge and the sensitivity of the receiving environment to adverse effects; and*
 - (b) The Applicant's reasons for the proposed choice; and*
 - (c) Any possible alternative methods of discharge including discharge into any other environment.*
997. I have had regard to the nature of the discharge and the sensitivity of the receiving environment to adverse effects in the AEE Section of this report.

Considering the need for the proposed discharge, I note the scale of established development throughout the district and existing stormwater infrastructure. I also note that the Applicant will be required to look into identifying alternative ways to manage stormwater through the SMP and Implementation Plan development, but there is little to no alternatives as for where the stormwater is discharged.

998. The Applicant has addressed Section 105 of the RMA, and alternative methods to the proposed discharges have been provided in Section 10 of the AEE.

Section 107 – Restrictions on Grant of Certain Discharge Permits

999. Under Section 107(1) of the RMA a consent authority shall not grant a resource consent for the discharge of a contaminant to water (incl. coastal water), or onto or into land, if after reasonable mixing the discharge is likely to give rise in the receiving environment, to:

- (c) The production of conspicuous oil or grease films, scums, foams, floatable or suspended material:*
- (d) Any conspicuous change in the colour or visual clarity:*
- (e) Any emission of objectionable odour:*
- (f) The rendering of fresh water unsuitable for consumption by farm animals:*
- (g) Any significant adverse effects on aquatic life.*

1000. The Applicant considers that the proposed treatment of stormwater is designed to ensure that surface water quality is the same or better as a result of the proposed treatment of the discharges compared with the current situation. Based on this, and the information provided in the AEE, the Applicant considers the discharges to be unlikely to give rise to any of the effects referred to in Section 107.

1001. As discussed in the 'Mitigation' Section and other sections above, insufficient information has been provided by the Applicant as to how construction sites and industrial and HAIL sites are being managed under the CSNDC. On this basis, I consider that the assessment under Section 107 of the RMA is difficult, as the discharges from unmanaged or poorly managed sites have the potential to result in any of the above effects in the receiving environment.

1002. The assessment of the proposal against Section 107 of the RMA is also dependent on consideration of the 'existing environment'. As noted, the Applicant has not established that it is not feasible to consider the 'existing environment' without including the existing stormwater discharges, as well as residual adverse effects. However, regardless of whether an unusual case can or cannot be established, additional stormwater discharges under the CSNDC may result in conspicuous colour or clarity change and may have significant effect on aquatic life.

1003. Section 107(2) of the RMA states that a consent authority may grant something that will contravene 107(1) if it is satisfied that:

- (a) That exceptional circumstances justify the granting of the permit; or*
- (b) That the discharge is of a temporary nature; or*
- (c) That the discharge is associated with necessary maintenance work-
And that it is consistent with the purpose of the Act to do so.*

1004. I do not consider that the discharge is either temporary or for the purpose of maintenance work.

1005. However, exceptional circumstances may exist due to the necessity of the stormwater infrastructure to discharge, and therefore I consider that the CSNDC should only be granted if the issues identified above are addressed and a clear and robust approach is provided as to how stormwater from development sites and HAIL and industrial sites is managed. These requirements should form part of the resource consent conditions.

RECOMMENDATION

Duration

Overview

1006. The Applicant has sought a duration of 25 years. In summary, the reasons are:

- a. Processes of obtaining the CSNDC are a major expense which CCC needs to be mindful of and minimise to the greatest extent possible;
- b. Given the forward-looking nature of the CSNDC and the investment involved, CCC considers it reasonable to have a longer duration;
- c. Good alignment is provided with the Surface Water Strategy developed over many years, and the SWiM mechanism is available to monitor the implementation. It will also be subject to the normal consent monitoring processes and review provisions.
- d. A long duration is also required for the long life of the assets being consented (at least 80 years or longer).
- e. It is likely that quite gradual improvements will take place as existing unmitigated discharges are improved over time.

1007. The Applicant considers that granting a resource consent for a more limited time period would undermine the collaborative effort that has been progressing between the councils on stormwater management over the past decade. It would introduce the need for more frequent and costly re-consenting at the expiry of the consent, rather than allowing the consent and conditions to 'bed in' and be monitored and managed over a realistic timeframe.

1008. I do not disagree with the above statements, and in considering an adequate consent duration, I have had regard to the following factors developed through case law that are relevant to the determination of the duration of a resource consent:²⁹

- a. The duration of a resource consent should be decided in a manner which meets the RMA's purpose of sustainable management;
- b. Whether adverse effects would be likely to increase or vary during the term of the consent;
- c. Whether there is an expectation that new information regarding mitigation would become available during the term of the consent;
- d. Whether the impact of the duration could hinder implementation of an integrated management plan (including a new plan);

²⁹ *Ngati Rangi Trust v Genesis Power Ltd* [2009] NZRMA 312 (CA); *Genesis Power Ltd v Manawatu-Wanganui Regional Council* (2006) 12 ELRNZ 241, [2006] NZRMA 536 (HC); *Royal Forest and Bird Protection Society of New Zealand Inc v Waikato Regional Council* [2007] NZRMA 439 (EnvC); *Curador Trust v Northland Regional Council* EnvC A069/06.

- e. That conditions may be imposed requiring adoption of the best practicable option, requiring supply of information relating to the exercise of the consent, and requiring observance of minimum standards of quality in the receiving environment;
- f. Whether review conditions are able to control adverse effects (the extent of the review conditions proposed is also relevant bearing in mind that the power to impose them is not unlimited);
- g. Whether the relevant plan addresses the question of the duration of a consent;
- h. The life expectancy of the asset for which consents are sought;
- i. Whether there was/is significant capital investment in the activity/asset;
- j. Whether a particular period of duration would better achieve administrative efficiency.

Sub-regional Section Development

1009. The LWRP operates at two levels; a region-wide section, which contains the objectives, policies and rules that apply across the region, and sub-regional sections, which contain policies and rules which are specific to the catchments covered by that section.

1010. Where freshwater outcomes (numeric and descriptive) and limits have been collaboratively determined at a catchment scale, these outcomes are included in the relevant sub-regional section. I note that for the Christchurch-West Melton Zone no specific freshwater outcomes have been set through the sub-regional section development process, which is currently scheduled in the CRC's Planning Programme for notification in 2022. This means that the biophysical, cultural, social and economic consequences of establishing catchment specific freshwater outcomes and limits for this zone have not been collaboratively assessed with stakeholders and the community.

1011. In the absence of catchment specific freshwater outcomes and limits the LWRP provides for region-wide freshwater outcomes (Table 1) and limits (Schedule 8), the intention of the region-wide freshwater outcomes and limits was not considered to introduce any preconception of what limits should be determined at the sub-regional catchment level. Section 2.7 of the LWRP states that:

It is vital that communities in those catchments openly consider social, biophysical, economic and cultural costs and benefits under a range of limits specific to that catchment before deciding on a desired end point. In this way, communities can determine the best solutions for their catchments.

1012. The proposed Policy 4.11 of the PC5 relates to the sub-regional section development and states:

The setting and attainment of catchment specific water quality and quantity outcomes and limits is enabled through:

(a) Limiting the duration of any resource consent granted under the region-wide rules in this Plan to a period not exceeding five years past the expected notification date (as set out in the Council's Progressive Implementation Programme) of any plan change that will introduce water quality or water quantity provisions into Sections 6 – 15 of this Plan; [...]

1013. Section 104(1)(b)(vi) requires the consent authority to have regard to any relevant provisions of a proposed plan. The CSNDC application was made under the LWRP region-wide rules, and a plan change that would introduce water quality and/or water quantity provisions into Section 9 of the LWRP is

currently scheduled for 2022. Therefore, as discussed in the 'Objectives and Policies' Section above, Policy 4.11 of PC5 is relevant to this application, is beyond legal challenge and substantial weight should be given to it. Policy 4.11 indicates that an expiry date of 2027 should be imposed on the CSNDC (if granted), provided a revised PIP confirms the 2022 notification date for the Christchurch West Melton sub-regional section plan change.

1014. Case law has determined that the term 'have regard to' requires the decision maker to give the matters genuine attention and thought; however, the decision maker is not necessarily required to accept these matters. The matters can be given weight as considered appropriate.³⁰
1015. A short duration can be considered reasonable where the impact of the resource consent duration could hinder the implementation of an integrated management plan (including a new plan), when at such time the re-evaluation of the consent from an RMA perspective is likely to be required.³¹
1016. I also note the recent Environment Court Decision in *New Zealand Energy Ltd v Manawatu-Wanganui Regional Council*, where 'unusual circumstances' enjoyed by the applicant resulted in a long consent duration, despite clear planning direction towards a shorter consent duration to meet a catchment expiry date. This was due to the Court considering that as a fresh consent would inevitably be granted, a shorter duration was a waste of time.³²
1017. On this basis, the question of weight to be given to Policy 4.11 of PC5 will essentially be a matter for the decision maker to consider along with what would be an appropriate duration of the CSNDC (if granted). Notwithstanding this, I consider that weight should be given to the policy.

Conclusion

Short-term Duration

1018. I consider that a short-term duration until 2027 (i.e. five years after the scheduled notification of the Christchurch–West Melton sub-regional section in 2022) would likely be seen as unsatisfactory for CCC as longer-term certainty is sought. I do not consider that an approximately eight-year resource consent term would provide this certainty, given the proposal actually seeks to improve water quality over a much longer time period.
1019. I also want to highlight the time and money spent by CCC on the CSNDC application to date, which I acknowledge is a significant investment. Granting a short-term resource consent would, in my opinion, not be an ideal allocation of rate payers' money, as the Applicant would be required to go through another similar, likely costly process in the not-so-far-away future without having the chance to effectively implement all measures proposed under the CSNDC.
1020. A short-term duration needs to be balanced against current role of stormwater in affecting surface water quality and associated values in Christchurch, as stormwater is the primary source of contaminants and may also be a key matter to be considered under a sub-regional plan.
1021. However, given the uncertainties around the C-CLM and the proposed reductions of contaminant loads over the duration of the resource consent and

³⁰ *Environmental Defence Society Inc v New Zealand King Salmon Company Limited* [2014] NZSC 38; *Clevedon Cares Inc v Manukau City Council* [2010] NZEnvC 211.

³¹ *Royal Forest and Bird Protection Society of New Zealand Inc v Waikato Regional Council* [2007] NZRMA 439 (EnvC).

³² *New Zealand Energy Ltd v Manawatu-Wanganui Regional Council* [2016] NZEnvC 59.

the management of construction and high-risk sites, there is a risk for more significant adverse effects that anticipated. One way to address these uncertainties is to grant a short-term resource consent for eight years, and to ensure that over this timeframe, CCC will develop and implement a strategy to provide for an adequate management approach for these sites post-2025.

Intermediate-term Duration

1022. Overall, provided the recommendations made throughout this report are adopted by the Applicant, I am of the opinion that the CSNDC will provide for an integrated management approach that aims at improving both discharge quality and the quality of the receiving environments. While there are questions as to what water quality outcomes and limits are adequate, I consider that it is appropriate for these to be set through stakeholder and community engagement of the sub-regional section development process.
1023. Overall, while I understand that a longer-term resource consent is desirable for the Applicant, I also consider it important to take into account the outcomes and limits that may be set by stakeholders and the community for water quality and quantity within the Christchurch City. Through this process, and other processes such as LTPs and associated public consultation, the community will be able to have their say on how resources and rate funding are assigned on improving water quality in the receiving environments. In essence, the rate payers will need to weigh up through the sub-regional plan development what they want CCC to invest bearing in mind the financial implications on the ratepayers.
1024. In general, I am of the opinion that a 15-year duration would be appropriate if the Applicant accepts the recommendations around managing stormwater runoff from construction sites, provides a clear approach to managing HAIL and industrial sites and demonstrates a clear commitment to improving the receiving environments by providing more certainty around mitigation measures and implementation timeframes. Adopting these recommendations would address some of the main concerns around water quality within the District, and this would unlikely be contrary to any outcomes and limits set in the sub-regional plan development.
1025. In summary, I consider that a duration of 15 years would:
- a. Allow for the development and notification of the Christchurch–West Melton sub-regional section;
 - b. Allow the plan change process to proceed through the notification, submission, hearing and potential appeals processes; and
 - c. Provide CCC with sufficient time after the plan change becoming operative to develop an approach to respond to the new water quality and quantity outcomes and limits and prepare a new resource consent application that takes into account the sub-regional policy framework.

Long-term Duration

1026. If a longer duration (i.e. more than 15 years) is generally considered appropriate by the Hearing Panel, I consider that a review condition should be included in order to enable bringing the CSNDC's water quality and quantity targets in line with the outcomes and limits developed through the sub-regional section development process. In absence of such a review condition, I consider that a longer-term resource consent should not be granted.

1027. Granting a 25-year duration with a review condition would ensure that community inputs into the Christchurch–West Melton sub-regional section development are recognised and that the stormwater network discharges would not be contrary to the catchment-specific outcomes and limits in the long term.

Grant or Decline


1028. The proposed Adaptive Management Approach is considered appropriate to manage stormwater under the CSNDC. I agree that the approach of one overarching resource consent outlining the objectives and targets for managing stormwater, with SMPs and an Implementation Plan sitting beneath the resource consent, is a sensible approach to simplify the administration and to reduce the resources required to obtain individual discharge permits.
1029. There are some challenges with this approach, however, specifically in the level of information currently available and the information needed to determine the effects of the discharges, which has been discussed throughout this report. Subject to the recommended changes, the approach should ensure that the effects of the proposal are acceptable and in line with the relevant regional plan policies. Further, the approach is considered to promote the sustainable management of natural and physical resources, thus providing consistency with Part 2 of the RMA.
1030. However, in order to grant the CSNDC application, the Hearing Panel will need to be satisfied that either the effects of the proposal are minor, or that the proposal is not contrary to the objectives and policies of the relevant plans.
1031. As discussed above, the adverse effects of the proposed non-complying activity stormwater discharges on the environment have the potential to be more than minor in terms of freshwater and coastal water quality, whereas no conclusion can be drawn as to whether Ngā Rūnanga are adversely affected by the proposal.
1032. The proposal, as put forward by the Applicant, is inconsistent with some of the relevant objectives and policies of the relevant plans. However, as discussed above, I consider that the proposed stormwater discharges meet the gateway test of being not contrary to the objectives and policies of the relevant proposed plan and/or plan, as it is consistent with the key outcomes sought by the relevant regional plans in relation to stormwater discharges (i.e. the integrated management of stormwater network discharges, demonstrating a commitment to meet plan outcomes in receiving environments and improve discharge quality).
1033. Notwithstanding whether the existing discharges (including the expired resource consent CRC090292) are considered to form part of the existing environment, the CSNDC will cover new discharges and will ultimately result in additional contaminants being discharged from new development, which will enter the receiving environments.
1034. However, the Applicant has demonstrated a general commitment to improve the quality of the stormwater discharges to work towards achieving the proposed Receiving Environment Objectives and Targets, which are generally in line with the outcomes sought by the relevant regional plans.
1035. Key information gaps have been identified required to determine the application. In particular

- a. A clear approach to managing stormwater discharges from construction and high-risk sites under the CSNDC post 2025 has not been provided by the Applicant. Therefore, there is a potential for adverse effects on water quality being more than anticipated if no clear and robust process/approach is in place;
 - b. There is a lack of certainty around implementation and efficiency of mitigation measures and thus uncertainty around when the outcomes sought by the CSNDC might be achieved, i.e. the issues raised around the C-CLM and the inability to comment on what the proposed contaminant load reductions might achieve in the receiving waterways, in terms of water quality or ecological health improvement; and
 - c. While a letter of non-opposition was provided from Ngā Rūnanga, I cannot conclude as to whether Ngā Rūnanga are adversely affected by the proposal.
1036. On this basis, I consider that the CSNDC application can be granted if the Applicant provides further information to address these uncertainties and/or adopts the recommendations made throughout this report. The key information gaps and recommendations to be addressed are:
- a. Identification and confirmation of cultural values;
 - b. Adopting a TSS limit for discharges from construction sites and developing of a robust approach/process by 2025 to ensure that stormwater discharges from construction sites are adequately managed post- 2025;
 - c. Developing of a robust approach/process by 2025 to ensure that stormwater discharges from high-risk HAIL and industrial sites are adequately managed post- 2025;
 - d. Provision of catchment specific CLMs and further information or revised models to determine adequacy of C-CLM assumptions around land uses and treatment efficiencies;
 - e. Adopting of recommended changes to Schedule 7 (Receiving Environment Objectives and Targets for Water Quantity) of the proposed conditions.

RECOMMENDED CONDITIONS

1037. Given the number of changes recommended, a set of draft recommended conditions has not been provided at this stage. This is to allow for further discussions between CCC and CRC prior to and during the hearing to finalise the recommended conditions.

Signed:



Date:

1 October 2018

Name:

Nick Reuther
Senior Consents Planner

Reviewed by:

Signed:



Date:

1 October 2018

Name:

Paul Hopwood
Principal Consents Advisor

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**APPENDIX 1: Evidence of Mr Rowan Freeman, CRC Principal Science Advisor,
Environmental Science and Hazards**

APPENDIX 2: Evidence of Mr Zeb Etheridge, CRC Senior Scientist, Groundwater Science

**APPENDIX 3: Evidence of Mr Michael Law, Senior Water Resources Engineer
(Beca)**

**APPENDIX 4: Memorandum by Jolene Irvine, CRC Engineering Planning Advisor
and Matthew Surman, CRC Asset Management Engineer**

APPENDIX 5: Evidence of Ms Michele Stevenson – Senior Scientist, Surface Water Science (Freshwater)

APPENDIX 6: Evidence of Dr Lesley Bolton-Ritchie – Senior Scientist, Surface Water Science (Coastal)

APPENDIX 7: CLM Additional Information Letter from CCC

APPENDIX 8: Letter of Non-opposition from Ngā Rūnanga

APPENDIX 9: Summary of Submissions

APPENDIX 10: Legal Advice on Existing Environment
