

CULTURAL IMPACT ASSESSMENT

ŌTĀKARO/AVON RIVER STORMWATER MANAGEMENT PLAN



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Prepared by K4 Cultural Landscape Consultants Ltd
for the Christchurch City Council.

Cover Page Image: File Christchurch City Libraries Reference CCL Photo CD 4, IMG0087. Source: The Canterbury Times, 16 Dec. 1900, p.16

Cambridge Terrace area looking north between Worcester and Gloucester Streets, between 1859 and 1865. The bridge in the foreground was known as the Land Office Bridge and occupied the site of the present Worcester Street Bridge. The buildings in the background are the Canterbury Provincial Buildings, taken before the erection of the stone Council Chamber on the south end.

Stormwater run-off from urban, industrial and rural environments can have significant effects on water quality and waterway health. Improving stormwater management requires on site, land-based solutions to stormwater disposal, alongside initiatives to reduce the presence of sediments and contaminants in stormwater, and reducing the volume of stormwater requiring treatment. Low impact development and low impact urban design are fundamental features of sustainable stormwater management. Aligning stormwater treatment and disposal with best practice methods will have an overall benefit to water quality.

Mahaanui Iwi Management Plan 2013

E kore a Parawhenua e haere ki te kore a Rakahore.

Parawhenua would not flow if it were not for Rakahore.

This saying joins the personification of water (Parawhenua) to that of rock (Rakahore), acknowledging the inter-dependence of certain things in life.

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BACKGROUND

ŌTĀKARO/AVON RIVER

1. The Ōtākaro / Avon River was an important part of the interconnected network of trails through the swampy marshlands of Christchurch to specific mahinga kai, kāinga and nohoanga located throughout the wider region.
2. There were a number of historical settlements found along its margins and a significant variety of kai gathered supported by it.
3. The significance of the Ōtākaro / Avon River has been recognized within the dual place name provisions of the Ngāi Tahu Claims Settlement Act 1998, which recognise Ōtākaro/Avon as the name for the whole of the river.

TRIBAL STRUCTURE & REPRESENTATION

4. Ngāi Tahu society was traditionally structured around whanau, hapū, iwi and waka affiliations.
 - **Whānau** – extended family units.
 - **Hapū** – collection of related whānau.
 - **Iwi** – collection of related hapū.
 - **Waka** – the ancestral double hulled yachts that related iwi affiliate to.
5. Today, Ngāi Tahu are organized around eighteen marae based communities (Papatupu Marae), each recognised under the Te Rūnanga o Ngāi Tahu Act 1996 and is represented by a Papatupu Rūnanga (assembly, council).
6. The takiwā (jurisdiction) of the each Papatupu Rūnanga is set out in Schedule 1 of the Te Rūnanga o Ngāi Tahu Act 1996.
7. The Ōtākaro/Avon River lies within the takiwā of the Ngāi Tūāhuriri Rūnanga, which “centres on Tuahiwi and extends from the Hurunui to Hakatere, sharing an interest with Arowhenua Rūnanga northwards to Rakaia, and thence inland to the Main Divide.”
8. The Ngāi Tūāhuriri Rūnanga is the mandated representative authority for Ngāi Tūāhuriri, one of the five primary hapū of Ngāi Tahu that is recognized as holding mana whenua (traditional rights and responsibilities) over the Ōtākaro / Avon River. The other primary hapū of Ngāi Tahu are Ngati Kuri, Ngati Irakehu, Ngāi Te Ruahikihiki, and Ngati Huirapa.
9. The Ngāi Tūāhuriri Rūnanga asserts ancestral rights and responsibilities of local Ngāi Tūāhuriri families and individuals to mahinga kai as guaranteed under the Treaty of WaitaNgāi / Te Tiriti o Waitangi (1840) and reserved under Sales and Purchase Agreement for Canterbury (Kemp’s Deed, 1848).
10. The Ngāi Tūāhuriri Rūnanga, together with the other five local Papatupu Rūnanga within the jurisdiction of the Christchurch City Council (CCC), have established a resource management company (Mahaanui Kura Taiao Ltd) to facilitate their engagement with

the CCC and other third parties in respect of their respective and collective resource management policies and objectives.

11. Specific Ngāi Tūāhuriri resource management policies and objectives for the Ōtākaro/Avon River have been set out in the Mahaanui Iwi Management Plan (2013), and the key stormwater policies have been assessed by the consent applicant in the preparation of the Comprehensive Stormwater Network Discharge Consent application.¹

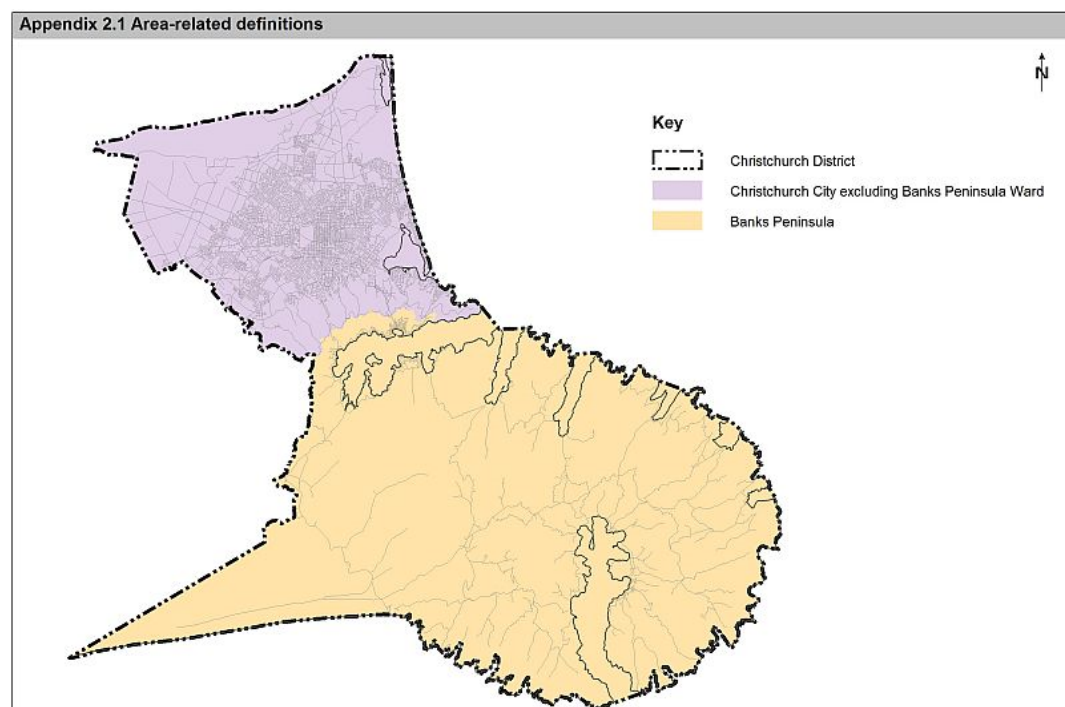
CONSENT APPLICANT

12. The consent applicant is the Christchurch City Council (CCC) whose jurisdiction covers the area outlined in Map 1.
13. CCC is responsible for stormwater management within its jurisdiction, and is in the process of establishing an integrated catchment management approach to better recognize and provide for a range of relevant considerations, including cultural values.

STORMWATER DISCHARGE CONSENT

14. The CCC is currently preparing documents in support of its application for a Comprehensive Stormwater Network Discharge Consent (CSNDC).
15. The CSNDC will supersede the current interim city global consent (ICGC), as well as the South-West and Styx River discharge consents.

Map 1 – Area under the jurisdiction of the CCC.



(Source: Proposed Christchurch Replacement District Plan)

¹ Cultural Impact Assessment for the Christchurch City Council Comprehensive Stormwater Network Discharge Consent, Boffa Miskell (June 2015).

ENGAGEMENT WITH LOCAL NGĀI TAHU

16. CCC have been working with Mahanui Kura Taiao Ltd to engage with affected Papatupu Rūnanga in the development and assessment of the proposed stormwater discharge consent.
17. In total, 3 separate hui have been held with Rūnanga representatives including:
- **March 2015** – initial hui to provide an overview of the proposed consent, process, application and draft conditions;
 - **May 2015** – site visit of key stormwater treatment facilities around the city; and
 - **June 2015** – a follow up meeting.
18. Moving forward, CCC have committed to ongoing collaboration with Papatupu Rūnanga as part of the consent, including:
- the preparation of Cultural Impact Assessment reports for all proposed Stormwater Management Plans within the city;
 - the investigation (in partnership with Tangata Whenua) and identification of significant mahinga kai sites for protection and restoration;² and
 - the cultural monitoring/assessment of those environments every five years.³

RECOMMENDATION 1

That CCC establishes and resources a focused Papatupu Rūnanga Stormwater Management Working Party to facilitate ongoing engagement with all 6 Papatupu Rūnanga from within the CCC district, Mahanui Kura Taiao and, where appropriate, Te Rūnanga o Ngāi Tahu, and contribute to such groups as the Joint CCC/ECan Storm Water Issues Management Working Party (SWIM).

COMMENTS

- Coordination between local government agencies and across local rūnanga from within the Greater Christchurch district will be essential if we are to effectively implement SMPs.
- Feedback from Papatupu Rūnanga indicates a strong desire to (a) work with the CCC and ECan in the design and location of stormwater treatment devices so that they deliver multi-dimensional benefits; and (b) help develop capital works programmes, education initiatives and reporting mechanisms that facilitate the implementation of each SMP.
- These outcomes can be provided for within consent conditions and/or through a separate agreement between the parties.

² Recommendation 6 of the Ōtākaro/Avon River SMP (p152).

³ e.g. State of the Takiwa (see <https://www.takiwa.org.nz/>)

CULTURAL VALUES

19. CCC understands the high cultural value of the Ōtākaro / Avon River to local Ngāi Tahu, especially its springs and mahinga kai.
20. In recognition of these cultural values, the CCC has:
- Engaged with local Papatupu Rūnanga representatives in the preparation of the CSNDC application;
 - Assessed their application against key policies and objectives of the Mahaanui Iwi Management Plan (2013) and the Ngāi Tahu Freshwater Policy (1999);
 - Considered the findings and recommendations contained in the two State of the Takiwā Reports on the Avon Heathcote Catchments (2007, 2013);
 - Developed a multi-valued approach to surface water management that assesses proposed stormwater measures and treatment devices against six key values, namely: Landscape; Ecology; Recreation; Heritage; Culture & Drainage;
 - Recommended the funding of a limited waterway restoration programme focused on Ōtākaro/Avon River tributaries above Mona Vale, sites of high cultural significance and springs.
21. Whilst cultural values are one of the “six values” for waterways that have guided CCC’s surface water management plan and proposed stormwater treatment strategy, the Council recognises that it is still important that each SMP undergoes a comprehensive cultural review to ensure matters of importance to affected Papatupu Rūnanga have been adequately considered.
22. The following sections identify those matters in respect of the Ōtākaro/Avon River catchment.

RANGATIRATANGA

23. *Rangatiratanga* means a range of things from sovereignty and liberty, to wealth and prosperity.
24. *Tino rangatiratanga* was recognized and guaranteed to Maori in Article II of the Maori text of the Treaty of Waitangi.⁴ The English text rendered this phrase as “the full, exclusive and undisturbed possession”. Contemporary Treaty discourse suggests, however, that a more accurate translation would have been “absolute sovereignty”.
25. In the context of resource management today, *rangatiratanga* speaks to the rights and responsibility of local Ngāi Tahu representatives to engage meaningfully in decisions that affect their rights, interests and values. Ngāi Tahu, through their respective Papatupu Rūnanga, seek to be able to determine their own destiny so that they can build and sustain their communities as they have done so in the past.⁵

⁴ *Tino* is an intensifier (e.g. *pai* means ‘good’; *tino pai* means ‘very good’).

⁵ See, for example, <http://Ngaitahu.iwi.nz/te-rūnanga-o-Ngāi-tahu/papatipu-rūnanga/>

KAITIAKITANGA

26. *Kaitiakitanga* describes the philosophy of sustainable resource management.
27. It recognises that:
- All elements of an ecosystem are related from the top of the catchment to the bottom (*ki uta, ki tai*); and therefore
 - The most effective means to redress water quality issues and sustain mahinga kai values is to take an integrated catchment management approach from source to sea.
28. The ability for local Ngāi Tahu to engage with CCC and other agencies with legislative responsibility for the management natural resources with their takiwā, is fundamental to the notion of *rangatiratanga*.

MAHINGA KAI

29. *Mahinga kai* are traditional foods and other natural resources, the places where those resources are obtained, and the philosophies and practices that surround them.
30. The Ōtākaro / Avon River was one of the principal mahinga kai for local Ngāi Tahu, and eel weirs made from mānuka stakes were found half a mile from the river's mouth as late as the 1920s.⁶
31. Historic mahinga kai (sites) associated with the Ōtākaro/Avon River include:⁷
- Te Ihutai Maroro (Avon-Heathcote Estuary)
 - Ō-rua-paeroa (near Travis Wetlands)
 - Hereora (in Harewood)
 - Wairarapa (in Ilam)
 - Ōhikahuruhuru (in Upper Fendalton)
 - Te Warokuri / Waromuri (in Papanui)
 - Putaringamotu (Deans Bush, Riccarton)
 - Ōrakipaoa (in Upper Riccarton)
 - Waimaero / Waimairi (Upper Avon tributary)
 - Waikakariki / Te Oranga (Horseshoe Lake)
 - Motu-iti (in Bryndwr)
32. Kai (resources) harvested at those site included:⁸
- **Fish** – tuna (eel), īnaka (whitebait), kōkōpū (native trout), kanakana (lamprey), kekewai (freshwater crayfish), kākahi (freshwater mussel), tuere (blind eel) and pātiki (flounders).

⁶ Areas of Cultural Significance to Ngāi Tahu in the Christchurch Residential Red Zones at p 8.

⁷ Areas of Cultural Significance to Ngāi Tahu in the Christchurch Residential Red Zones; Te Whakatau Kaupapa (1990); Personal Comms: Pauling, C. (2015).

⁸ *Cultural Health Assessment of the Avon-Heathcote Estuary and its Catchment* (2007) prepared by Pauling, C., Lenihan, TM., Rupene M., Tirikatene-Nash, N., and Couch, R.

- **Birds** – pūtangitangi (paradise ducks), pārera (grey duck), raipo (sp. of duck), tataa (brown duck) and pāteke (teal).
- **Plants** – āruhe (fernroot) and kāuru (root of the tī kouka/cabbage tree).

RECOMMENDATION 2

That an investigation is conducted into the present use of Waikakariki / Te Oranga (Horseshoe Lake) as a stormwater attenuation facility in order that the cultural values associated with this waterbody can be recognized and provided within its future management (e.g. ensure stormwater is treated before entering this traditional mahinga kai).

KĀINGA & NOHOANGA

33. Ancestral settlements, permanent (kāinga) and seasonal (nohoanga), are important to local Ngāi Tahu given that they inform our understanding of Ngāi Tahu's ancestral relationships with this landscape.
34. The NZ Historic Places Trust has identified the Ōtākaro and its associated waterways as an area of high archaeological potential. It was an important travel route to and from Kaiapoi and the many permanent Ngāi Tahu settlements of Te Pātaka a Rākaihautū (Banks Peninsula).
35. There is potential, therefore, for archaeological sites to be discovered along the entire length of the river's banks and adjacent land areas⁹ containing taonga tūturu¹⁰ of national and tribal significance.
36. Traditional settlements along the Ōtākaro / Avon River include:
 - Pohoareare (Horseshoe Lake)
 - Puari (Market Place, Victoria Square, CBD)
 - Tautahi (The Bricks, CBD)
 - Ōtākaro (mouth of Avon River)
 - Waipapa (Little Hagley Park)
 - Te Kai a Te Karoro
 - Te Karoro Karoro

⁹ Past discoveries include a canoe being dug out of the south bank of the Ōtākaro above Burwood School, and a canoe paddle made out of mānuka found in the bed of the river about 400 meters west of the South Brighton bridge. (Areas of Cultural Significance to Ngāi Tahu in the Christchurch Residential Red Zones at p 8.)

¹⁰ Taonga tūturu is defined in the Protected Objects Act 1975 and means an object that (a) relates to Māori culture, history, or society; and (b) was, or appears to have been (i) manufactured or modified in New Zealand by Māori; or (ii) brought into New Zealand by Māori; or (iii) used by Māori; and (c) is more than 50 years old.

WAHI TAPU

37. Wāhi tapu are places of particular significance that have been imbued with an element of 'sacredness' or 'restriction' (i.e. tapu).
38. Of all wāhi tapu, urupā (burial grounds) are considered to be the most important. It is to be expected that historic burial grounds will be associated with traditional settlements along the Ōtākaro/Avon River.

RECOMMENDATION 3

That condition of consent require Accidental Discovery Protocols (ADP) for earthworks associated with the installation of stormwater treatment devices in the vicinity of traditional permanent and seasonal settlements.

WAHI TAONGA

39. Wāhi taonga are places treasured due to the vital role they have in sustaining local eco-systems (e.g. spawning / nesting grounds).
40. It is essential that they are protected as they provide for the needs of present and future generations.

COMMENT

That Recommendation 6 (Section 10, p152) of the Ōtākaro / Avon River SMP is fully endorsed and supported by the Ngāi Tūāhuriri Rūnanga, namely;

- That, in partnership with Tangata Whenua, investigations are carried out to identify existing and potential mahinga kai sites and significant springs, and a prioritized programmes for site protection and restoration is developed.

STORMWATER MANAGEMENT

41. In order to meet the receiving environment objectives of the CSNDC, the CCC is required to develop a Stormwater Management Plan (SMP) for each river catchment in the City as specified in Table 1.
42. The term SMP is used to describe the surface water management scheme for a particular river or receiving body catchment.
43. The purpose of each SMP is to study the impact of stormwater on the catchment, and then identify means by which to mitigate some of those impacts.

Table 1: SMP Programme

Catchment	Date of lodgment with ECan
Ōtākaro/Avon River Area Christchurch	30 June 2015
Pūharakekenui/Styx River Area Christchurch	30 June 2015
Huritini/Halswell Area Christchurch	30 June 2015
Ōpāwaho/Heathcote River Area Christchurch	30 Dec 2016
Estuary and Coastal Area Christchurch	30 Dec 2018
Outer Area Christchurch	30 Dec 2018
Te Pātaka o Rākaihautū/ Banks Peninsula Settlements	30 Dec 2020

44. The stormwater mitigation measures and treatment devices recommended within a SMP will be considered in the context of the ‘six values’ that CCC have adopted to inform and guide surface water management (namely: Landscape, Ecology, Recreation, Heritage, Culture and Drainage).
45. Within this multi-value framework, the SMP process in respect of water quality is to:
- Identify existing catchment water quality issues;
 - Estimate the impact of future urban growth (including intensification) on water quality;
 - Identify the negative impacts that existing and future stormwater discharges have on water quality;
 - Devise a suite of mitigation measures (including planning, education, enforcement, source control, etc) to maintain and improve water quality;
 - Confirm the effectiveness of chosen mitigation measures by catchment modeling;
 - Prepare a specimen design for stormwater treatment facilities and devices;
 - Forward recommended non-structural measures to the appropriate CCC team for action; and
 - Obtain ECan consent for stormwater discharge pursuant to the SMP.
46. In essence, therefore, the SMP is a “concept design” for stormwater treatment and detention that will guide surface water management over the duration of the stormwater discharge consent. “Detailed design” will be required for each stormwater mitigation site in order to best ensure existing and future stormwater discharges meet catchment objectives.

COMMENT

- Where appropriate (e.g. adjacent to wāhi taonga and mahinga kai), Papatupu Rūnanga wish to be involved in these design discussions in order to help ensure cultural values are suitably recognized and provided for.

47. The planning horizon for SMPs is proposed to be 35 years, to be reviewed by CCC on a 10 yearly basis.

48. SMPs will address:

- The maintenance or improvement of water quality and ecosystem health, particularly significant wetlands and springs;
- The reduction of the adverse effects of flooding;
- The protection and restoration of attributes that contribute to Ngāi Tahu values;
- The avoidance or mitigation of erosion and the effects of sediment discharge;
- The separation of stormwater from the sewage wastewater network

49. SMPs shall include, amongst other things:

- Mitigation methods for the management of flooding, water quality, erosion, ecological effects and, where applicable, cultural effects;
- A cultural impact assessment and summary of outcomes resulting from any collaboration with Ngāi Tahu on the SMP;

RECOMMENDATION 4

- That, before the development of any future SMP, CCC and MKT discuss the process of engagement undertaken in preparing this SMP in order to streamline this process moving forward.

ŌTĀKARO/AVON RIVER STORMWATER MANAGEMENT PLAN

50. The Ōtākaro/Avon River SMP has been guided by:

- The Council's *Surface Water Strategy* (2009), which identifies overall goals and objectives for the city's rivers and waterways; and
- The Mahaanui Iwi Management Plan (2013), which sets objectives for the Ihutai / Avon-Heathcote Estuary catchment.

51. Technical studies undertaken in the development of this SMP confirm that the existing water quality in the Ōtākaro / Avon River is "fair to poor".

52. The main objective of the Ōtākaro/Avon River SMP is to maintain and, where appropriate, improve over time the existing in the receiving environment.

53. The CCC recognizes that stormwater treatment devices alone are unlikely to deliver water quality outcomes that meet all objectives, and that a suite of measures will be required as part of an integrated SMP strategy (e.g. planning measures, source control techniques, education and enforcement).
54. To make a difference to the existing water quality of the Ōtākaro / Avon River, therefore, it will be necessary to not only mitigate any adverse effects from new urban growth, but also retrofit stormwater quality mitigation measures throughout the existing developed urban environment.

RECOMMENDED STORMWATER TREATMENT STRATEGY

55. Contaminant loads were modeled for four of the six stormwater treatment scenarios ranging from Scenario C: treating only new and rebuilt areas (with a developed area coverage of 19%, to Scenario F: catchment wide retro-fit (with a developed area coverage over 75%).
56. According to the modeling, a stormwater treatment strategy approximately equivalent to the Scenario E – “Retrofit Priorities” (with a developed coverage area of 68%) – will need to be implemented in order to achieve improvement in the existing water quality throughout the catchment for all the contaminants tested (i.e. suspended solids/sediments, zinc, copper and hydrocarbons).
57. The Stormwater Treatment Strategy recommended in the Ōtākaro/Avon River SMP in Section 6.2.6 is to:
 - Continue **New & Rebuild** activities (i.e. Scenario C) – *low cost to CCC*;
 - Investigate all **Opportunities** (i.e. Scenario D) identified in the SMP and implement those that are both acceptable and feasible – *relatively high cost to the CCC*;
 - Pursue all **Retrofit Priorities Opportunities** (i.e. Scenario E) identified in the technical reports as critical – *at moderate cost to the CCC*;
 - Retain and expand the provisions of the existing Interim Global Stormwater Consent (IGSC) for individual sites;
 - Implement the stormwater clauses of the new *CCC Water Supply, Wastewater and Stormwater Bylaw 2014* (section 7.2); and
 - Investigate environment street sweeping and more frequent sump cleaning as short term mitigation measures during the early years of strategic implementation.
58. The total estimated capital expenditure cost (CAPEX) to the CCC of this strategy is \$101.4 million spread over 25-30 years.
59. Implementation of this option is only expected to deliver slow improvements in water quality over the 35 year planning horizon.
60. The SMP recognizes that stormwater treatment devices alone are unlikely to deliver water quality outcomes that meet all objectives, and that planning measures, source

control techniques, education in parallel with enforcement will also need to be pursued if water quality targets and stakeholder aspirations are to be realised.

61. The stormwater treatment devices associated with the recommended Stormwater Treatment Strategy comprise of:

- Rain gardens
- Tree pits
- Storm water filter devices
- Source control measures, and
- Waterway restoration (e.g. dredging accumulated sediments).

RAIN GARDENS

62. Rain gardens are a preferred stormwater quality treatment device in the Ōtākaro/Avon catchment because of:

- The relatively small footprint area required for a high level of treatment achieved;
- Their suitability for use on a street-scale to large catchment basis; and
- The multi-dimensional benefits they provide, including street amenity, storm attenuation and increased biodiversity.

63. Modeling demonstrates that rain gardens can provide significant flood attenuation benefit in addition to their primary stormwater quality treatment benefit.

64. Like other small stormwater treatment devices, however, rain gardens will require a high level of maintenance to ensure that they operate effectively.

STORMWATER TREE PITS

65. A stormwater tree pit is a bio-retention device for stormwater quality treatment that accommodates a large tree. It can be considered as a special type of rain garden.

66. For stormwater treatment function alone, rain gardens are likely to be preferred to tree pits as they will be cheaper. Where trees are planned to be planted anyway, then they will be economical.

STORM FILTERS

67. Underground filtration devices that are an option for stormwater treatment where no space is available (or limited) for surface treatment facilities.

68. Their efficacy depends on effective and regular maintenance.

SOURCE CONTROL MEASURES

69. Controlling stormwater contaminants at their source is generally the most effective and efficient way of avoiding adverse effects on the receiving environment (e.g. copper free brake linings; control exotic water fowl numbers; more sump cleaning; permanent treatment devices for all significant road reconstruction).

EDUCATION

70. The need for an ongoing education programme is another city-wide issue that has been recognized in the Ōtākaro/Avon River SMP.

COMMENT

- Where appropriate (e.g. adjacent to sites of significance), Papatupu Rūnanga wish to be involved in the design and implementation of an education programme in order to help ensure cultural values (including the use of te reo / the maori language) are suitably incorporated.

ISSUES

71. The principal issues relating to stormwater management in the Ōtākaro / Avon River catchment that have been identified in the SMP are:

- Water Quality & Ecological Health
- Sea Level Rise
- Earthquake Damage
- Disjointed Funding
- Limited Green-Fields Development
- Other Constraints

WATER QUALITY & ECOLOGICAL HEALTH

72. Stormwater pollution is widespread throughout the Ōtākaro/Avon River catchment, and a number of indicator values for urban spring-fed plains rivers that are set out in the proposed Land and Water Regional Plan (pLWRP), have been widely exceeded.
73. Contaminants of concern include zinc, hydrocarbons, e-coli, suspended sediments and copper.
74. Recorded levels are likely to have an adverse effect on biota (zinc and nitrogen), result in excessive aquatic weed growth (phosphorous and nitrogen), or pose a risk to contact recreation (e-coli).
75. The issue for the SMP is how to arrest the decline in surface water quality and ecological health of the waterways in the face of limited urban growth and site redevelopment over the next 35 years.
76. Specific management solutions offered in the Ōtākaro / Avon SMP include:¹¹

¹¹ A number of these recommendations align with those provided in the 2007 and 2012 State of the Takiwā reports, including the elimination of contaminants over time, and riparian restoration using indigenous species.

- Maintain the fast-flowing riffle habitats of the river;
 - Focus on reducing contaminants in tributaries, especially those most contaminated (eg old industrial area like Addington, Antigua and Wainoni);
 - Remove sediment; and
 - Add riparian planting of evergreen species to reduce leaf fall.
77. Two approaches for stormwater quality treatment measures have been adopted in the Ōtākaro/Avon River SMP:
- Address priorities identified in the technical studies;
 - Take advantage of opportunities for stormwater treatment presented by other complimentary programmes (eg Street Renewal Programme; Major Cycleways Project; Suburban Centers Programme; Suburban Greenspace).
78. School Closures and Council Reserves: existing reserves and other open spaces represent an opportunity to retrofit larger treatment devices within their boundaries. The majority of them, however, are already heavily used for recreational purposes.

SEA LEVEL RISE

79. Sea Level Rise (SLR) is an important factor in stormwater management in this catchment as the level of service of the stormwater drainage system will decline over time due to the backwater effects of higher river and tide levels.
80. The current District Plan Review recommends that the CCC plans for a one meter SLR over the next 100 years.

EARTHQUAKE DAMAGE

81. Earthquake damage to the city's stormwater and open channel network has been extensive.

DISJOINTED FUNDING

82. The estimated capital cost of the recommended stormwater management option (section 6.2.6) is \$101 million. The Council's 2016 Long Term Plan has proposed \$20 million to be spent on stormwater management in the Ōtākaro/Avon catchment over the next 10 years.
83. In order to succeed, however, the Ōtākaro/Avon SMP must be embraced across the Council. Asset managers and project managers responsible for assets other than the stormwater network will need to accept stormwater quality treatment as an integral part of their projects and provide for them within their respective budgets.
84. To date there has been an understandable reluctance by asset and project managers to seriously consider retro-fitting stormwater treatment devices because that are seen as

an additional cost not specifically provided for in their project budgets. This attitude is likely to continue until adequate additional funding is provided through the LTP.

‘GREENFIELDS’ DEVELOPMENT

85. The amount of new or ‘greenfields’ development anticipated in the future within the study area is limited by the available open space left (less than 3%) of the total Ōtākaro/Avon SMP area. Large stormwater treatment and detention basins, wet ponds and constructed wetlands are not, therefore, an available solution (the exception being the new Prestons subdivision where such devices will be installed).

OTHER CONSTRAINTS

86. A number of constraints exist which determine the feasibility and type of stormwater treatment measures that can be deployed, including:
- **Groundwater Depth:** generally speaking, shallower groundwater restrict the types of treatment options available. Rain gardens, for example, are depth dependent.
 - **Contamination:** sites where contamination and/or landfills exist are generally not suitable for treatment devices and so will be excluded from possible consideration.
 - **Sea Level Rise:** the assumption has been made that within the 35 year consent horizon (2015-2050), 0.35meters of SLR will take place. No stormwater treatment device will therefore be installed below RL 11.85m.
 - **Airport Noise Contour:** within this area, no devices which store water for longer than 24hours are permitted.
 - **Existing Services:** may, in some circumstances, prohibit the retro-fitting of devices (eg tree pits), or markedly increase the cost of doing so.

IMPACTS ON CULTURAL VALUES

87. The following section looks at a number of additional issues raised for consideration by local Papatupu Rūnanga representatives in the drafting of this CIA Report, and makes recommendations to assist CCC resolve them.

RANGATIRATANGA

ISSUE: Meaningful Participation in Decision Making

88. The SMP does not clearly indicate what ongoing involvement Ngāi Tahu representatives¹² will have in adopting the Ōtākaro/Avon River SMP, monitoring its implementation, and/or reviewing and updating it over time.

¹² Affected Papatupu Rūnanga, Mahaanui Kura Taiao and/or Te Rūnanga o Ngāi Tahu, individually or collectively.

RECOMMENDATION 5

- That future SMPs explicitly recognise the ongoing involvement of Ngāi Tahu representatives in their implementation and review; that this is provided for within the conditions of consent of the CSNDC, or via a side agreement to the same effect; and that CCC liaises in the first instance with Mahaanui Kura Taiao Ltd to ensure the appropriate Papatupu Rūnanga are involved.

COMMENTS

- The SMP acknowledges that there are many constraints to meeting all objectives and aspirations for stormwater management in this catchment, and that an opportunistic and iterative approach will be needed.
- Papatupu Rūnanga representatives consider that it is important, therefore, that they remain abreast of actual stormwater management measures as they are planned, implemented, monitored, reviewed and reported: including (a) the drafting of future SMPs, and (b) the review and potential redrafting of consent conditions.
- Papatupu Rūnanga will want to be assured that mitigation measures proposed in the SMP are implemented and that all opportunities to improve mahinga kai values (including water quality and quantity issues) are taken moving forward.
- A vehicle to ensure ongoing involvement and meaningful participation in decision making has been proposed above at Recommendation 1: namely, a bespoke inter-Papatupu Rūnanga Stormwater Management Working Party that is resourced, has access to technical expertise, and can contribute into the Joint CCC/ECan Stormwater Issues Management Working Party (SWIM).

KAITIAKITANGA

ISSUE: Facilitating Implementation

89. Papatupu Rūnanga are concerned about the number of factors that potentially constrain the effective delivery of the Stormwater Treatment Strategy adopted in the Ōtākaro/Avon River SMP, particularly the ongoing availability of funds and CCC staff to implement it.

RECOMMENDATION 6

- That a tangible link is created between the Ōtākaro/Avon River Stormwater Treatment Strategy and CCC's annual capital works programme to ensure that budgets and staffing requirements are available to implement, monitor, enforce and review it.

COMMENT

- Papatupu Rūnanga agree that stormwater treatment devices and improved stormwater infrastructure are critical to improving water quality and enhancing mahinga kai outcomes within this catchment, and wish to help ensure that the objectives of the Ōtākaro/Avon River SMP and its proposed stormwater treatment strategy are adequately provided for moving forward.

ISSUE: Ongoing Direct Stormwater Discharges to Waterways vs. Mitigation and Requirements for Treatment

90. While the Ngāi Rūnanga is opposed to the ongoing direct discharge of untreated stormwater to natural waterways,¹³ it is acutely aware of the serious challenge faced by the Applicant to prevent this from happening in this catchment. The Rūnanga understands, for example:

- That existing stormwater treatment facilities serve only 3% of the developable area in the catchment.¹⁴ The rest, by corollary, currently discharges untreated into the receiving environment; and
- That the catchment is already largely developed and there is limited remaining space to establish larger, more cost effective stormwater treatment devices (e.g. detention basins, swales and constructed wetlands).

91. While the Ngāi Tūāhuriri Rūnanga supports the suite of measures proposed in the Ōtākaro/Avon River Stormwater Treatment Strategy, it is conscious that the exact implementation of the strategy is still uncertain and by no means guaranteed.

92. Ultimately, the Rūnanga would like for all stormwater discharges to be treated before entering natural waterways, and that the design of stormwater treatment devices provide for multiple values, including education.

RECOMMENDATION 7

- (as per Recommendation 1) That CCC establishes and resources a focused **Papatupu Rūnanga Stormwater Management Working Party** to facilitate the involvement of Papatupu Rūnanga representatives in decisions relating to the design and prioritization of stormwater treatment measures that progressively realise CCC and Papatupu Rūnanga aspirations for stormwater treatment and disposal in this catchment.

¹³ See policies P6.1(d), P6.2 and TAN2.2 of the Mahaanui Iwi Management Plan 2013 which advocate for the use of rain gardens, swales, basins and wetlands to treat stormwater and improve both water quality and mahinga kai outcomes.

¹⁴ Section 9.1.2 draft Ōtākaro/Avon River SMP.

ISSUE: Global Consents / Consent Duration

93. The Ngāi Tūāhuriri Rūnanga is opposed to global consents¹⁵ due to the lack of specific information, including customized conditions, as well as uncertainties around implementation. This is true for the proposed CSNDC, where implementation relies heavily of SMPs yet to be developed, whose robustness can also not be ascertained at the time of seeking consent.
94. The Ngāi Tūāhuriri Rūnanga is also opposed to consent durations over 15 years¹⁶ due to the intergenerational nature of effects, as well as the potential for new technologies to be developed over that period that facilitate the realization of SMP objectives, but which otherwise could not be considered.

RECOMMENDATION 8

- That the term of the CSNDC is reduced from 35 years to 10 years, or 15 years with a review period every 5 years.

COMMENTS

- Reducing the term from 35 to 10 (or 15, with a review period every 5 years) could alleviate concerns around the global nature and uncertainty of the CSNDC. It would also align the consent with the CCC's Long Term Plan (2015-2015) and other strategic documents that also have a life of 10 years.
- In 5 years, all SMPs will have been developed and a review of their content and implementation timely.

MAHINGA KAI

ISSUE: Are the effects of the proposed Stormwater Treatment Strategy “less than minor”?

95. According to the Contaminant Load Modeling (CLM) undertaken in the development of the Ōtākaro/Avon River SMP, the effects of the proposed Stormwater Treatment Strategy will be “less than minor”.
96. Underpinning this conclusion is the assumption that all of the stormwater treatment devices and interventions proposed by the strategy are in place.
97. Given the constraints acknowledged in the SMP and outlined above (paragraphs 71-86), this will take time at best, and may never happen at worst (c.f. too expensive, change of political whim).
98. Thus, while the Ngāi Tūāhuriri Rūnanga supports the suite of measures proposed in the Ōtākaro/Avon River Stormwater Treatment Strategy, it questions whether it is possible to say that the effects of this application will be “less than minor”.

¹⁵ Mahaanui Iwi Management Plan 2013, Policy P6.6

¹⁶ Mahaanui Iwi Management Plan 2013, Policy WM8.14

RECOMMENDATIONS 10-11

- (as per Recommendation 8) That the term of the CSNDC is reduced from 35 years to 10 years, or 15 years with a review period every 5 years.
- (as per Recommendation 1) That CCC establishes and resources a focused **Papatupu Rūnanga Stormwater Management Working Party** to facilitate the involvement of Papatupu Rūnanga representatives in decisions relating to the design and implementation of monitoring programmes.

COMMENTS

- In 10 years (ie by 2025), all SMPs will have been developed and their performance monitored against the “6 values” for at least 5 years (noting that the Banks Peninsula SMP is proposed to be completed in 2020).

ISSUE: Will proposed monitoring parameters support Mahinga Kai objectives?

99. The Ngāi Tūāhuriri Rūnanga seeks the continual improvement of water quality in both freshwater and coastal environments, particularly where current standards may not be being met. The primary motivation is to protect and enhance mahinga kai values and thereby help ensure that local whānau can continue to exercise their rights and enjoy the benefits of their culture.¹⁷
100. The Ōtākaro/Avon SMP recommends the extension of regular water quality monitoring to include strategic locations within the stormwater network downstream of priority catchments for retrofitting stormwater treatment devices (Recommendation 6, Section 10, p152).
101. Cultural monitoring is also proposed, which is supported wholeheartedly by the Ngāi Tūāhuriri Rūnanga.
102. That said, the Ngāi Tūāhuriri Rūnanga understands that the water quality objectives for the CSNDC do not include an objective to ensure safe food gathering, even though the regional policy sets this as a goal for all waterways,¹⁸ and the Mahaanui Iwi Management Plan seeks water quality standards that protect and provide for the relationship of Ngāi Tahu to freshwater, allowing Ngāi Tahu and the wider community to participate in mahinga kai/food gathering activities without risks to human health¹⁹

¹⁷ c.f. Table 4 of CSNDC that relates to coastal waters and which has shellfish gathering standards.

¹⁸ Canterbury Natural Resources Regional Plan (2009), Chapter 9, Objective 3.

¹⁹ Policy WM6.2. Note also Policy 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.

RECOMMENDATIONS 12-14

- That cultural monitoring on a 5-yearly basis is supported.
- That water quality monitoring parameters recognise the relationship of Ngāi Tahu to freshwater and allow Ngāi Tahu and the wider community to participate in mahinga kai/food gathering activities without risks to human health.
- That monitoring objectives include specific targets over specific time periods to show continuous improvement in the receiving environment and/or each catchment (e.g. Standards for years 1-10, 10-15, 15-20 etc).

OPPORTUNITIES

103. The Ōtākaro/Avon River SMP recognizes that, if water quality objectives are to be met, it will be important to take advantage of opportunities presented by other complimentary programmes. This is particularly true given the developed nature of this catchment, where space available for the installation of stormwater treatment devices is so limited.

104. Opportunities exist throughout the catchment that offer stormwater quality benefits through the installation of rain gardens, tree pits, permeable paving, storm filters. These include:

- Street Renewal Programme
- Major Cycleways Project
- Suburban Centers Rebuild Programme
- Central City Rebuild
- Suburban Greenspace*
- School Closures*
- Residential Red Zone*

() = potential for larger treatment devices*

105. Of all of these opportunities, the Residential Red Zone potentially presents the most benefit given the amount of open space (greenfields) available relative to other parts of the catchment.

RESIDENTIAL RED ZONE

106. Though the future of the Residential Red Zone (RRZ) along the Ōtākaro / Avon River is unknown, it represents an opportunity for the installation of larger, more cost effective stormwater treatment facilities to treat the non-RRZ catchment.

107. The Ōtākaro/Avon River SMP has assumed that the RRZ will remain undeveloped and proposes the installation of 13 facilities, including 8 with wetlands. The estimated cost of building the 13 facilities is \$24.9 million (not including the cost of the land itself).

108. Any development in this area should be required to treat any runoff in the same way that a green-fields sub-division is required to treat runoff.

RECOMMENDATION 15

- That representatives of all 6 Papatupu Rūnanga from within the CCC district, Mahaanui Kura Taiao and, where appropriate, Te Rūnanga o Ngāi Tahu, engage with both CCC and CERA to ensure that opportunities for stormwater treatment and flood attenuation within both the Central City (including via Anchor Projects) and the Residential Red Zone are considered and maximized.

CONCLUSIONS

109. Policy IH1.1(i) of the Mahaanui Iwi Management Plan²⁰ describes Ngāi Tahu's aspiration for improved stormwater management and infrastructure that reflects Ngāi Tahu values,
110. The draft Ōtākaro/Avon River SMP assessed in this report, and the integrated catchment management approach promoted by the CCC through the CSNDC, raises the bar in terms of stormwater management in the city (including Banks Peninsula).
111. Increasingly, CCC stormwater management policies and proposed practices are aligning with the key Mana Whenua policies as set out in the Mahaanui Iwi Management Plan 2013, and the development of the Ōtākaro/Avon River SMP has not only considered cultural values, but also sought to provide for them through such measures as those listed paragraph 20 of this report.
112. The Applicant has concluded that these measures have the potential to contribute significantly to the delivery of key Ngāi Tahu objectives (e.g. improved water quality). The CCC also recognizes that their ability to deliver on all key objectives ultimately depends on the adoption of the stormwater treatment strategy by other CCC programmes and projects, including the funding of those matters within their own respective budgets.
113. Thus, even though the Ōtākaro/Avon River SMP seeks to mitigate the effects of stormwater discharges through a number of site specific mitigation measures and thus improve the quality of water within the Ōtākaro/Avon River, the exact implementation of such measures is uncertain and not guaranteed.
114. Like the CCC, Ngāi Tūāhuriri is here for the proverbial 'long haul', and understands that the amelioration of water quality and mahinga kai values in the Ōtākaro/Avon River will require patience, persistence and improved partnerships within and across each respective entity.
115. While the Ngāi Tūāhuriri Rūnanga does not support all aspects of the proposed Ōtākaro/Avon SMP,²¹ it does support the integrated catchment management approach adopted by the CSNDC and provided for by the SMPs for each river catchment within the city.

²⁰ Section 6.5 Ihutai, Ngāi Tahu and the Urban Environment, Rebuild of Ōtautahi.

²¹ c.f. paragraphs 90 and 93 ("direct discharges" and "35 year consents" respectively).

116. The key factor in regards to the recognition and provision of core cultural values (e.g. mahinga kai) over the life of the CSNDC will be ensuring that local Ngāi Tahu representatives²² are engaged meaningfully with the CCC and ECan around the decision making table.

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- Te Rūnanga o Ngāi Tahu Act 1996

²² Papatupu Rūnanga, MKT and, where appropriate, Te Rūnanga o Ngāi Tahu.

APPENDIX A – Table of Recommendations

1. That CCC establishes and resources a focused Papatupu Rūnanga Stormwater Management Working Party to facilitate ongoing engagement with all 6 Papatupu Rūnanga from within the CCC district, Mahanui Kura Taiao and, where appropriate, Te Rūnanga o Ngāi Tahu, and contribute to such groups as the Joint CCC/ECan Storm Water Issues Management Working Party (SWIM).
2. That an investigation is conducted into the present use of Waikakariki / Te Oranga (Horseshoe Lake) as a stormwater attenuation facility in order that the cultural values associated with this waterbody can be recognized and provided within its future management (e.g. ensure stormwater is treated before entering this traditional mahinga kai).
3. That conditions of consent require Accidental Discovery Protocols (ADP) for earthworks associated with the installation of stormwater treatment devices in the vicinity of traditional permanent and seasonal settlements.
4. That, before the development of any future SMP, CCC and MKT discuss the process of engagement undertaken in preparing this SMP in order to streamline this process moving forward.
5. That future SMPs explicitly recognise the ongoing involvement of Ngāi Tahu representatives in their implementation and review; that this is provided for within the conditions of consent of the CSNDC, or via a side agreement to the same effect; and that CCC liaises in the first instance with Mahanui Kura Taiao Ltd to ensure the appropriate Papatupu Rūnanga are involved.
6. That a tangible link is created between the Ōtākaro/Avon River Stormwater Treatment Strategy and CCC's annual capital works programme to ensure that budgets and staffing requirements are available to implement, monitor, enforce and review it.
7. (as per Recommendation 1)
8. That the term of the CSNDC is reduced from 35 years to 10 years, or 15 years with a review period every 5 years.
9. (as per Recommendation 8)
10. (as per Recommendation 1)
11. That cultural monitoring on a 5-yearly basis is supported.
12. That water quality monitoring parameters recognise the relationship of Ngāi Tahu to freshwater and allow Ngāi Tahu and the wider community to participate in mahinga kai/food gathering activities without risks to human health.

13. That monitoring objectives include specific targets over specific time periods to show continuous improvement in the receiving environment and/or each catchment (e.g. Standards for years 1-10, 10-15, 15-20 etc).
14. That representatives of all 6 Papatupu Rūnanga from within the CCC district, Mahanui Kura Taiao and, where appropriate, Te Rūnanga o Ngāi Tahu, engage with both CCC and CERA to ensure that opportunities for stormwater treatment and flood attenuation within both the Central City (including via Anchor Projects) and the Residential Red Zone are considered and maximized.