Three Waters Infrastructure and Environment Committee
MINUTES ATTACHMENTS

Date: Wednesday 6 April 2022
Time: 9.33am
Venue: via audio/visual link

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MINUTES OF THE MEETING OF THE CANTERBURY WATER MANAGEMENT STRATEGY WAIMAKARIRI ZONE COMMITTEE HELD IN THE COUNCIL CHAMBER AT THE RANGIORA SERVICE CENTRE, 215 HIGH STREET, RANGIORA, ON MONDAY 1 NOVEMBER 2021 AT 3.30PM.

PRESENT

Michael Blackwell (Chairperson) Erin Harvie, Carolyne Latham, Wendy Main, Judith Roper-Lindsay, John Cooke (Te Ngāi Tūāhuriri Rūnanga representative), Arapata Reuben (Te Ngāi Tūāhuriri Rūnanga representative), and Councillor Sandra Stewart (WDC Councillor).

IN ATTENDANCE

Councillor P Redmond (WDC Councillor), Councillor G Edge (ECan Councillor), M Bate (Kaiapoi Resident), R Johnston (Oxford Farmer), J Ensor (Mandeville Resident), D Hill (North Canterbury News) and J Benn (Department of Conservation).

S Allen (WDC Water Environment Advisor), D Lewis (WDC Land Drainage Engineer), A Arps (ECan Zone Manager), K Whitwell (ECan Principal Communications and Engagement Advisor), M Griffin (ECan CWMS Facilitation Team Leader) and T Kunkel (WDC Governance Team Leader).

KARAKIA

M Griffin provided the karakia to open the meeting.

1 BUSINESS

1.1 Apologies

Moved: E Harvie Seconded: A Reuben

Apologies were received and sustained from Martha Jolly and Councillor Megan Hands (ECan Councillor) for absence.

CARRIED

1.2 Welcome and Introductions

The Chairperson welcomed all the members present and requested members and attendees to introduce themselves to the members of the public in attendance.

1.3 Register of Interests

E Harvie advised that she had been appointed as the Lead Co-ordinator for the Waimakariri Landcare Trust and she was now also a full member of the New Zealand Institute of Primary Industry Management. She therefore requested that the Register of Interests be updated accordingly.

2. OPPORTUNITY FOR THE PUBLIC TO SPEAK

2.1 M Bate – Kaiapoi Resident

M Bate showed various photos of dead trees and new growth in the Lineside Road Drain, Courtney Steam, and Kaiapoi River (near the Askeaton Boat ramp) area. He noted that if the trees had died due to saltwater intrusion, there would not be any regeneration or new trees growing in these areas. Also, some of the dead trees were not close enough to the waterways to be effected by saltwater intrusion. He therefore believed that the trees had been poisoned by the spraying of chemicals.

J Roper-Lindsay questioned when the older trees had died, she asked if it was possible that the 2011 earthquake could have caused a surge in saltwater intrusion thus killing the trees. She noted that the killing of the trees by spraying chemicals would mean that the spraying had to have occurred on a regular basis over a long period of time, and it was unclear who would have done this. She therefore suggested that the possibility should be investigated that the trees died due to the occurrence of a natural event.

M Bate noted that the saltwater intrusion was still occurring annually, if the trees had therefore died due to saltwater intrusion, there would be no new trees growing in these areas. He therefore maintained that the trees had been poisoned over an extended period of time by the consistent spraying of chemicals along the waterways.

M Bate also tabled a notice that appeared in the local newspaper that listed the various rivers in the Canterbury Region that were scheduled to be spayed in 2022. The notice also listed the chemicals to be used such as glyphosate, triclopyr, metsulfuron, etc. He noted that the food chain was continuously being poisoned and the biodiversity along the waterways was declining each year.

M Bate expressed his dismay with the spraying for weed control done by ECan between the Ashley Gorge and the Okuku River confluence. Although the undergrowth in this part of the river was not indigenous, it at least provided some biodiversity and assisted with the controlling of flooding.

In conclusion, he noted that the birds were being blamed for the deterioration of the Lineside Road Drain. However, the fact that the drain had been sprayed with chemical for the last 20-years was not being taken into consideration.

A Reuben advised that Ngāi Tūāhuriri also objected to the use of the Sodium fluoroacetate, and other chemicals, due to their effect on the natural environment. The effect of the chemicals could be observed in sharp rise in illnesses that modern communities were struggling with. He further noted that the Christchurch West Melton Water Zone Committee was able to persuade the Christchurch City Council not to use chemicals around public open spaces.

J Roper-Lindsay enquired if the Waimakariri District Council also had a Global Spraying Plan. S Allen confirmed that the Council had a holistic weed control plan. However, she advised that the notices that appeared in local newspaper usually listed all the areas that may need weed control in the next year. She clarified this was a generic notice, and did not mean that all the areas listed would actually be sprayed.

2.2 **R Johnston – Oxford Farmer**

R Johnston enquired if there had been any process made with the exploratory drilling to establish the relationship between the Christchurch Aquifer System and groundwater sources north of the Waimakariri River. He noted with concern that the winter feed crop restrictions contained in Plan Change 7 to the Canterbury Land and Water Regional Plan were based on the relationship to the Christchurch aquifers. However, R Johnston's inquiry on this matter suggests it would now seem that the connection was not based on proven fact, but rather on opinion. He therefore believed that the public was led astray on this matter, as the possibility of contamination of the Christchurch Aquifer System by the Waimakariri District's groundwater was very small.

R Johnston also raised a point regarding the zoning colour coding used for parts of the Waimakariri District in the Plan Change 7 maps, as it was no true indication of the ground coverage in the district. He further also believed that the Ashley/Rakahuri River should not have been sprayed for weed control, as a more forceful approach was needed to ensure effective results.

In conclusion, R Johnston again invited the CWMS Waimakariri Zone Committee members to visit his property to look at the damage that the Ashley/Rakahuri River had done to the river frontage of his property. He noted that the river protection work done at his property frontage had survived the recent flood event in May 2021. However, it directed the water downstream and caused destruction further down the river.

2.3 **J Ensor – Mandeville Residents**

J Ensor believed that the Council had successfully managed the nitrates in the Waimakariri District's water supply and the maintenance of its water infrastructure, thereby ensuring the high quality of its drinking water. He expressed a concern that ECan and the Council would not have control of the district's water supplies under the proposed Three Waters Reform. He therefore questioned if the CWMS Waimakariri Zone Committee would play a role in the monitoring of water standards after the proposed reform.

M Blackwell advised that the Three Waters Reform was outside the CWMS Waimakariri Zone Committee's brief. Councillor S Stewart confirmed the matter was being dealt with by the Council.

3. REPORTS

3.1 **ZIPA Implementation – First Quarterly Update 2021/22 – S Allen (WDC, Water Environment Advisor) and M Griffin (CWMS Facilitator, Ecan)**

M Griffin and S Allen took the report as read.

A Reuben sought clarity on the matrix used by Council staff to classify priority indigenous habitats for protection and enhancement. S Allen noted that the Council was using a matrix adapted from ECan's criteria for Significant Natural Areas (SNA) for the District Plan review.

A Reuben noted that Ngāi Tūāhuriri's views may differ on what should be considered a priority. J Roper-Lindsay explained that cultural, historical and educational values were excluded from the ECan criteria to ensure a matrix based solely based on ecological and biodiversity values.

In response to questions, S Allen advised that, based on past experience, the sampling being undertaken to test the nitrate limits in private wells would only be completed by end of November 2021. It was envisaged that a report on the results of the study would be available in February 2022. She noted that the Council had been advised that all results of private well testing must be submitted to the Ministry of Health and eventually to Taumata Arowai. It was hoped that more information on the state of private well supplies would become available as more data was collated by the Ministry of Health.

Councillor S Stewart requested additional information on the work being done by ECan in defining the boundaries of Private Supply Well Areas. S Allen undertook to ensure that the information was provided as part of the next quarterly update.

Councillor S Stewart also asked for additional information on the realignment of tributary of North Brook and the sampling at Tūtaepatu Lagoon. M Griffin undertook to ensure that the CWMS Waimakariri Zone Committee was updated on these matters.

J Roper- Lindsay noted that she was also interested in the results of the sampling at Tūtaepatu Lagoon. She suggested that the General Manager of the Tūhaitara Coastal Park, Greg Byrnes, be invited to update the CWMS Waimakariri Zone Committee on the general health of the park.

Moved: J Roper- Lindsay Seconded: A Reuben

THAT the CWMS Waimakariri Zone Committee:

(a) **Receives** the information and priority setting contained in this report.

CARRIED

3.2 **Braided River Revival Programme – Update – M Griffin (CWMS Facilitator, ECan) and A Arps (Northern Zone Manager, ECan)**

A Arps provided the CWMS Waimakariri Zone Committee with an update on the Braided River Revival Programme (Whakahaumanu Ngā Awa ā Pākihi). He highlighted the following:

- A brief outline of the Braided River Revival Programme, including ECan's role in managing braided rivers in the region.
- Explained that the Programme would not be regulatory driven, but would endeavour to create a holistic approach to braided river management.
- Clarified how the Ashely/Rakahuri River would be effected by programme, by focusing on current and planned projects.
- Community resilience issues, such as later erosion, gravel lock up, and habitat loss.
- Provided an overview of Ashley/Rakahuri River Vegetation Clearance Project.

M Blackwell stated that it was heartening to note that that an effort was being made to create more biodiversity along the braided rivers.

J Roper- Lindsay noted that the Biodiversity Working Group was very interested in the work being done to ensure biodiversity along the Ashley/Rakahuri River. She questioned if biodiversity assessments were done as part of the proposed Braided River Revival Programme. She was concerned that large areas of vegetation, including willows, were being removed without biodiversity assessments. She further noted that for the preservation of the food chain, it was also important to protect the instream biodiversity and not only focus on the banks of the river. A Arps explained that islands of vegetation had been left in the areas which had been cleared to maintain the biodiversity values in these areas. He noted that Courtney Bamber had been appointed by ECan as a Braided River Advisor, she and a team of specialists would be conducting various assessments of the braided rivers in Canterbury, including cultural and biodiversity assessments.

J Roper- Lindsay and A Reuben noted their worry that ECan's Braided River Revival Programme Plan did not make provision for consultation with the community and the CWMS Waimakariri Zone Committee. A Arps confirmed that the community and the Committee would be consulted on the programme.

In response to questions, C Latham advised that the CWMS Waimakariri Zone Committee did not have sufficient information to make a decision on the future flow of the Ashley/Rakahuri River. She believed that the community needed to be consulted on what vegetation would be considered acceptable to grow in the river. The Committee also needed more clarity on how the braided rivers would be managed once the work had been done.

J Roper-Lindsay raised a concern that the main objectives of the Braided River Revival Programme had never been discussed with the CWMS Waimakariri Zone Committee. There seem to be different anticipated outcomes from the programme, which was causing confusion. She suggested that there should be a discussion with all parties involved in the programme to ensure consensus on the future of the Ashley/Rakahuri River.

A Reuben agreed with J Roper-Lindsay, and stated that he was struggling to ascertain the benefits of the Braided River Revival Programme, as it did not seem to be a holistic consultative programme, but rather just many smaller projects along the Ashley/Rakahuri River. He questioned how ECan would be measuring the success of the programme.

A Arps advised that a large amount of the planned consultation for the Braided River Revival Programme had been delayed due to the May 2021 floods and the COVID-19 restrictions. He explained that the overall aim of the programme would be to return the Ashley/Rakahuri River to its natural character.

C Latham and J Roper-Lindsay stated that the CWMS Waimakariri Zone Committee needed more information on what would be considered the natural character of the Ashley/Rakahuri River and what projects needed to be implemented to return the river to this state.

M Blackwell noted that it may have been more productive if the CWMS Waimakariri Zone Committee and other stakeholders were consulted earlier on the Braided River Revival Programme.

Councillor G Edge advised that ECan had established a new Catchment Subcommittee, which would be looking at the future management of all the Canterbury Rivers in line with the National Policy Statement of Freshwater. He assured the CWMS Waimakariri Zone Committee that ECan would work with the Committee and other stakeholders to achieve the best possible outcome for the Ashley/Rakahuri River.

Moved: J Roper- Lindsay Seconded: W Main

THAT the CWMS Waimakariri Zone Committee:

(a) **Receive** the information taken into consideration the Committee's Action Plan Priorities and Engagement for 2021-2024.

CARRIED

4. COMMITTEE UPDATES – M GRIFFIN (ECAN)

4.1 Proposed Plan Change 7 – Canterbury Land and Water Regional Plan

In response to a question from E Harvie, M Griffin advised that the additional time granted by the Minister for the Environment had allowed the OVERSEER review report to be included in the documentation to be considered by the ECan Council on 17 November 2021. M Griffin confirmed that the ECan Council meeting to be held on 17 November 2021 would be open to the public.

Councillor G Edge explained that the ECan Council would be briefed on the recommendations of the independent hearing commissioners and the OVERSEER report on 10 November 2021, where after the information would be made available to the public on 11 November 2021.

4.2 Essential Freshwater Package – ECan Update on Freshwater Farm Plans

No discussion emanated from this point.

4.3 CWMS Progress Report 2021

No discussion emanated from this point.

4.4 **Zone Committee Working Groups**

- Landcare Working Group

  E Harvie noted that all the interested parties that attended the meeting on water quality monitoring in the Waimakariri District were very receptive to having a holistic approach to water quality monitoring.

- Biodiversity Working Group

  No discussion emanated from this point.

- Coastal Catchments Working Group

  No discussion emanated from this point.

- Monitoring Working Group

  No discussion emanated from this point.

4.5 **Zone Committee Action Plan 2021-2024**

No discussion emanated from this point.

4.6 **WDC Land and Water Committee**

Councillor S Stewart noted that the Land and Water Committee meeting would be held on 16 November 2021, were ECan would be updating the Committee on the work being done by the CWMS Waimakariri Zone Committee.

4.7 **Waimakariri Zone Communications Report (July – October 2021)**

No discussion emanated from this point.

4.8 **Lineside Road Drain**

M Blackwell advised that the problems being experienced at the Lineside Road Drain had also been raised at the Central Rural Drainage Advisory Group meetings. The responsibility for dealing with the Lineside Road basin drainage issues seemed to circulate between ECan and the Council, with the landowners getting frustrated in the middle. However, there seemed to be consensus that it is both a drainage problem and a water quality concern. He therefore urged ECan and the Council to work together in resolving this matter. If the problem could not be resolved, then ECan and the Council should at least take some action to mitigate the landowners' problems.

Councillor S Stewart endorsed the abovementioned comments made by M Blackwell. She was a member of the Central Rural Drainage Advisory Group and there was consensus within the Group that this was a drainage issue, caused by the Council's lack of maintenance of the Lineside Road Drain. She noted that resolving the problem was being delayed by the lack of clarity on the definition of a natural wetland in the National Policy Statement for Freshwater Management 2020. She noted that until the problems with the drain were solved, sediment would continue to flow and build-up in the Kaiapoi and Cam Rivers.

4.9 **Action Points from previous Zone Committee Meetings – August 2021**.

J Roper-Lindsay requested that the quarterly updates on water quality and ecological data for the Waimakariri District be included as a standard item in the CWMS Waimakariri Zone Committee's calendar.

Moved: J Cooke Seconded: E Harvie

THAT the CWMS Waimakariri Zone Committee:

(a) **Receives** these updates for its information, and with reference to the Committee's 2021 Work Programme and Community Engagement priorities.

CARRIED

5. CONFIRMATION OF MINUTES

5.1 **Minutes of the Canterbury Water Management Strategy Waimakariri Zone Committee meeting – 2 August 2021**

Moved: J Roper-Lindsay Seconded: A Reuben

THAT the CWMS Waimakariri Zone Committee:

(a) **Confirms** the amended Minutes of the Canterbury Water Management Strategy Waimakariri Zone Committee meeting, held on 2 August 2021, as a true and accurate record.

CARRIED

5.2 **Matters Arising**

None.

9 GENERAL BUSINESS

9.1 **Submission on the Minister of Environment's discussion document on wetlands**

J Roper-Lindsay tabled ECan's submission on the Minister of Environment's discussion document on wetlands, as she believed that members would benefit from studying the submission. The submission included the apprehensions surrounding the definition of a natural wetland. She commented that there seemed to be pressure on the Minister of Environment to ease the protection on natural wetlands, to allow, farming, quarrying, mining etc.

A Reuben confirmed that Ngāi Tūāhuriri had also made a submission on the Minister of Environment's discussion document on wetlands.

9.2 **Relationship between the Christchurch Aquifer System and groundwater sources north of the Waimakariri River**

C Latham expressed her concern about several inaccuracies in the statements made by R Johnston. The CWMS Waimakariri Zone Committee was extensively briefed on this matter and the relationship between the Christchurch Aquifer System and groundwater sources north of the Waimakariri River with the best science information available at the time. The committee consequently had to accept this relationship in its ZIPA recommendation for PC& and the drilling of monitoring wells was undertaken to help monitor this relationship with the Christchurch aquifers over time.

9.2 **Work being done by the CWMS Waimakariri Zone Committee**

The Chairperson thanked Michael Bate for his continued efforts to preserve the waterways in the Waimakariri District. He also expressed his gratitude to the Committee members for their support during the year.

The CWMS Waimakariri Zone Committee expressed their thanks for the governance work being done by Council staff, and presented T Kunkel with a gift voucher in appreciation.

KARAKIA

A Reuben provided the karakia to close the meeting.

NEXT MEETING

The next meeting of the CWMS Waimakariri Water Zone Committee was scheduled for the 31 January 2022 at 3:30pm.

THERE BEING NO FURTHER BUSINESS, THE MEETING CLOSED AT 5.45 PM.

CONFIRMED

_____ 31 January 2022

Chairperson Date


Sensitivity: General
Duvauchelle Wastewater Treatment and Disposal Renewal Scheme
Three Waters - 28 Mar 2022
Project 522/001375
Budget $14,484,000
Presenter Mike Bourke -Three Waters Asset Planning 28 March 2022
Christchurch City Council

Sensitivity: General

Background and Objectives

- The existing discharge Consent will expire on 28 Jan 2023
- The Te Wai Ora Tāne Integrated Water Strategy directs Council as part of Objective 8: Sustainable Wastewater Systems to discontinue discharging treated wastewater into the Akaroa Harbour
- Council staff and consultants have undertaken an extensive option study since 2012 to determine feasible options to discharge treated wastewater to land
- The Objective of this presentation is to provide information on the options, to enable agreement on the options to be taken forward for public consultation

Sensitivity: General

Summary of the Options

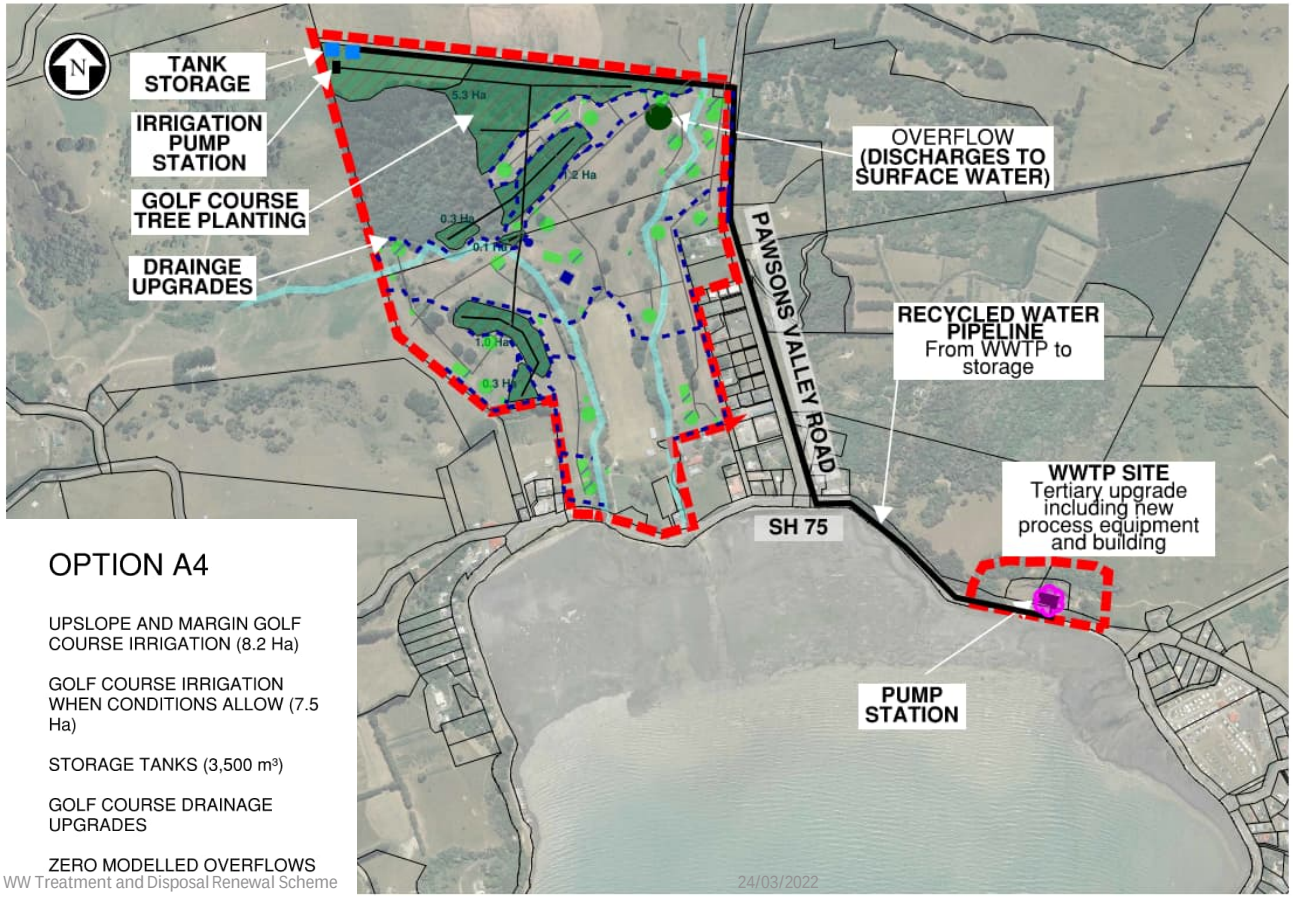
Ref.	Option	Plant Upgrade	Irrigation & Storage	CAPEX OPEX 35yr NPV	Net Carbon Emissions (35 years)	Cultural Wellbeing	Social Wellbeing	Economic Wellbeing	Environmental Wellbeing	Staff suggestion for consultation shortlist
A1	Irrigate wastewater onto tees, greens and approaches on a redeveloped 12 hole golf course and add a wetland	Major upgrade to meet spray irrigation standard	3.6 ha plus fairways and surrounds, 1 ha wetland + 5,000 m³ storage	≈$25M	×	May be acceptable to Ngāi Tahu depending on wetland performance	Initially favoured by golf club (no longer) but impacts the A&P Showground which would have to move	Very high costs	Potential impacts on water quality and ecology as regular overflows to stream winter. Difficult to consent	**Not recommended** due to very high costs, nutrient impacts on stream (NPSFM) and difficult to consent.
A2	Irrigate wastewater onto tees, greens and approaches on a redeveloped 12 hole golf course and also irrigate margin areas	Major upgrade to meet spray irrigation standard	3.6 ha fairways plus 9.6 ha of planted margins + 5,000 m³ storage	≈$25M ≈$380K ≈$30M	✓✓	May have a cultural challenge due to 1 in 5 year overflow of treated storage to harbour	Initially favoured by golf club (no longer) but impacts the A&P Showground. Course upgrades may offset the loss on holes.	Very high costs due to need for additional land and golf course upgrades	Likely minimal impacts on water resources + carbon benefits. Has a 1 in 5 year overflow frequency	**Not recommended** as similar to A1 and even higher costs
A3	Irrigate wastewater onto tees, greens and approaches on a redeveloped 12 hole golf course plus margin areas and neighbouring land	Major upgrade to meet spray irrigation standard	3.6 ha fairways plus 15.6 ha of planted margins plus neighbouring land + 5,000 m³ storage	≈$26M ≈$380K ≈$31M	✓✓✓	Likely favoured by Ngāi Tahu as no discharge to water	Initially favoured by golf club (no longer) but impact the A&P Showground. May be concern in community around irrigating neighbouring land.	Very high costs due to need for additional land and golf course upgrades	Minimal impacts on water resources	Not recommended as similar to A1 and even higher costs **However - subject to review by Councillors.**
A4	Irrigate wastewater onto tees, greens and fairways on existing 18 hole golf course during summer, Irrigate planted course margins including upslope area during Winter	Major upgrade to meet spray irrigation standard	Approx. 8-9 ha of trees plus approx. 3.0 ha golf course + 3,000 m³ storage	≈$13M ≈$280K ≈$17M	✓✓*	Likely favoured by Ngāi Tahu as no discharge to water	Favoured by golf club; beneficial reuse and benefit to Golf Club thus community. No obvious problems but need to select a storage location	Moderate cost due to need for major upgrade to Plant and additional irrigation and drainage infrastructure	Likely minimal impacts on water resources + carbon benefits. Irrigation for golf course reduces stream water take	Recommended due to moderate cost and community stakeholder support for reuse benefits. **Recommended by staff**
B1	Irrigate planted course margins including upslope area – retain 18 holes with storage on the golf course	Minor upgrade	6.2 ha of trees + 5,000 m³ storage	≈$9M ≈$200K ≈$13M	✓✓	May have a cultural challenge due to limitations in irrigated land and storage causing risk of 1 in 5 year overflow of treated storage to harbour	No obvious problems but need to select a storage location	Comparatively lower cost	Likely minimal impacts on water resources + carbon benefits. Risk of insufficient irrigable land or storage	Not recommended due to risk of Cultural and Environmental effects. **However – subject to option improvements through I&I reduction, or increase to land / storage / irrigation rate**
B2	Irrigate planted course margins including upslope area – reduce course to 12 holes with storage on the golf course	Minor upgrade	9.4 ha of trees + 3,200 m³ storage	≈$13.5M ≈$320K ≈$19M	✓✓	Likely favoured by Ngāi Tahu as no discharge to water	Golf course reduced to 12 holes, has impact on player experience so Golf Club no longer in favour. Land-sharing to offset with A&P Showground and Pony Club not favoured by parties	Comparatively lower cost	Likely minimal impacts on water resources + carbon benefits	Not recommended due to community opposition compared to other Golf Club options. **However – opportunities could arise if site Master Plan redeveloped**
B3	Irrigate planted course margins including upslope area –maintain 18 holes, and irrigate other land with storage on other land	Minor upgrade	9.4 ha of trees + 3,200 m³ storage	≈$9M ≈$200K ≈$13M	✓✓	Likely favoured by Ngāi Tahu as no discharge to water	No obvious problems but need to select a storage location	Comparatively low, but extra cost for additional land. Provides more capacity for growth.	Likely minimal impacts on water resources + carbon benefits	Recommended due to favourable balance of costs and benefits and greater operational flexibility. **Recommended by staff. Dependant on land owner negotiations**
C1	Dis-establish golf course and irrigate wastewater onto trees on the golf course land	Minor upgrade	19.1 ha of trees + 2,000 m³ storage	≈$8M ≈$200K ≈$12M	✓✓✓	Not favoured by Ngāi Tahu due to social impacts, albeit favoured for no discharge to water	Will be strongly opposed by Golf Club and wider community	Comparatively lower cost	Likely minimal impacts on water resources + carbon benefits	Low cost and positive environmental outcomes. Significant community impact. Alternative recreational use of site would have to be developed given reserve status. **Recommendation subject to review by Councillors**
D1	Irrigate wastewater onto land at the Head of the Bay	Minor upgrade	8.0 ha of trees + 4,500 m³ storage			Ngāi Tahu have expressed concerns due to Silent File but would discuss further if only land-based option available	Neutral – On private land	While the land is not for sale the owner may consider irrigation of native trees on site	Likely minimal impacts on water resources + carbon benefits	**Not recommended** as other options available with similar outcome for lower cost and avoid Silent File issue
D2	Irrigate land elsewhere on the western side of Akaroa Harbour Basin	Minor upgrade	Various			Unspecified as no consultation with Ngāi Tahu about this option	Unknown – No further sites of interest identified	Significantly higher cost due to additional conveyance (>distance to irrigation area) and land purchase costs	Likely minimal impacts on water resources + carbon benefits	**Not recommended** as other options available with similar outcome for lower cost
D3	Irrigate land in Robinsons Bay (Separate to Akaroa scheme land)	Minor upgrade	Approx. 11 ha of trees	≈$10M ≈$210K ≈$13M	✓	Favourable over discharge to harbour	Would receive significant community protest	Potentially higher costs but further study needed	Likely minimal impacts on water resources + carbon benefits	Not recommended by staff – due to high costs and likely strong opposition by local community. **However - subject to review by Councillors**
E1	Discharge to harbour	Major upgrade to meet discharge to water standard	N/A	≈$5M ≈$130K ≈$7M	×	Culturally unacceptable to Ngāi Tahu	No stakeholder feedback. Minor risk of public health impacts	Comparatively lower cost	Minor impacts on water quality and ecology	Difficult to consent due to cultural concerns and legal and policy settings **However - subject to review by Councillors**

**Indicative only; scoping and estimation in progress*

Sensitivity: General

Staff Recommended Option – A4

Irrigate wastewater onto trees, greens and fairways of existing 18 hole golf course during summer. Irrigate planted course margins including upslope areas during Winter



OPTION A4

UPSLOPE AND MARGIN GOLF COURSE IRRIGATION (8.2 Ha)

GOLF COURSE IRRIGATION WHEN CONDITIONS ALLOW (7.5 Ha)

STORAGE TANKS (3,500 m³)

GOLF COURSE DRAINAGE UPGRADES

ZERO MODELLED OVERFLOWS

EXTENT OF SITE
WATERWAY
NEW PIPEWORK
WATER STORAGE
NEW BUILDINGS / PUMP STATIONS
WETLANDS
TREE PLANTING IRRIGATION AND DRAINAGE
FAIRWAY AND SURROUNDS IRRIGATION AND DRAINAGE
WWTP MAJOR UPGRADE
WWTP MINOR UPGRADE
DRAINAGE UPGRADES

Wastewater flow basis:
- Duvauchelle WWTP flow data Nov2018-October 2020
- Historic climate data from 49-year period
- Resident population assumed to remain constant, holiday population to increase 33%
- Improvements to wastewater network assumed to reduce both Rain Derived Infiltration (RDI) and Ground Water Derived Infiltration (GWI) by 20%

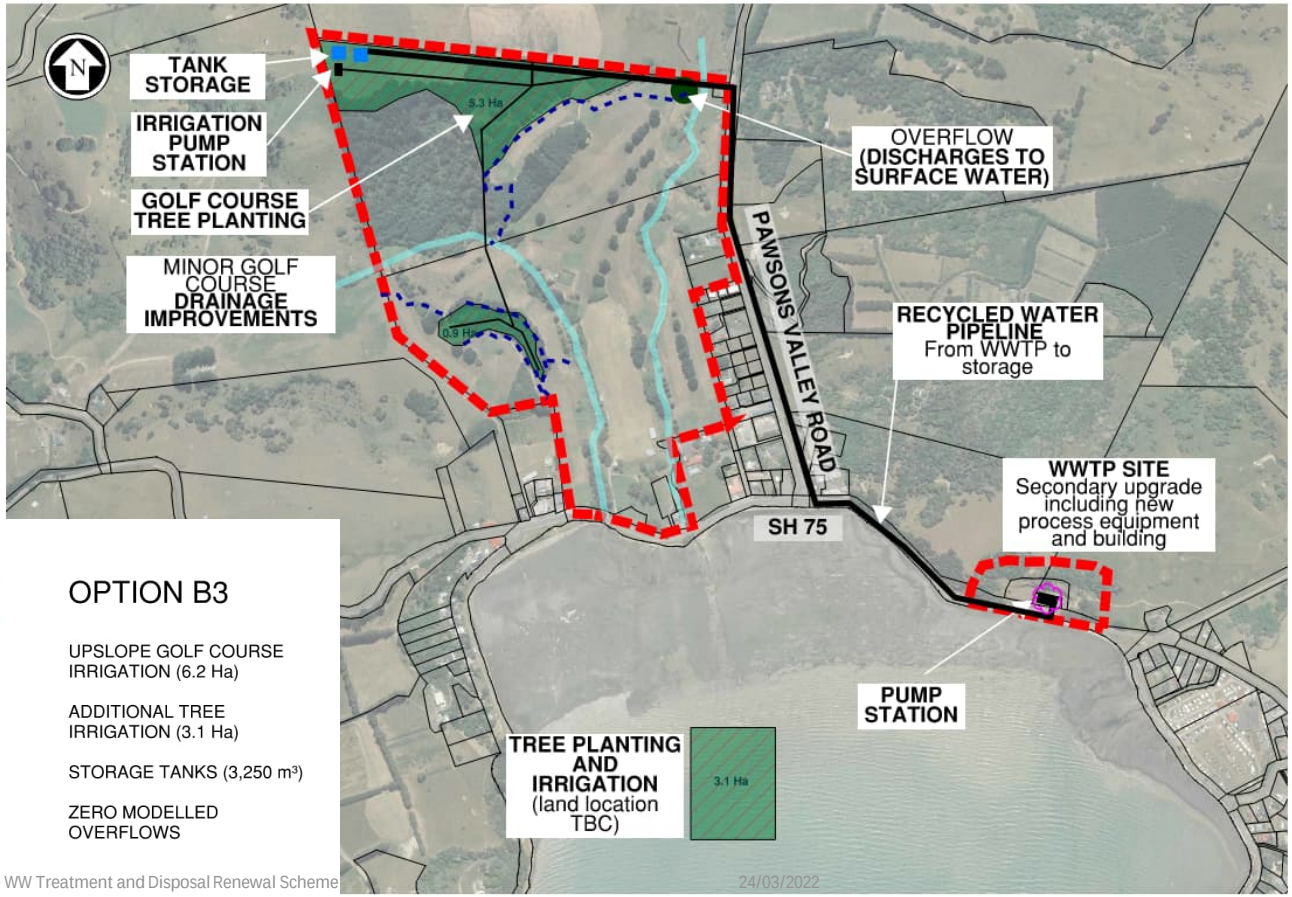
Irrigation Model Basis
- Historic climate data from 49-year period
- Dripper irrigation to trees (assumed moderate drainage area) at 1mm/day

$13M ($17M NPV)

Sensitivity: General

Staff Recommended Option – B3

Irrigate planted course margins including upslope areas. Maintain 18 holes and irrigate other land including providing storage on other land



OPTION B3

UPSLOPE GOLF COURSE IRRIGATION (6.2 Ha)

ADDITIONAL TREE IRRIGATION (3.1 Ha)

STORAGE TANKS (3,250 m³)

ZERO MODELLED OVERFLOWS

$9M ($13M NPV)

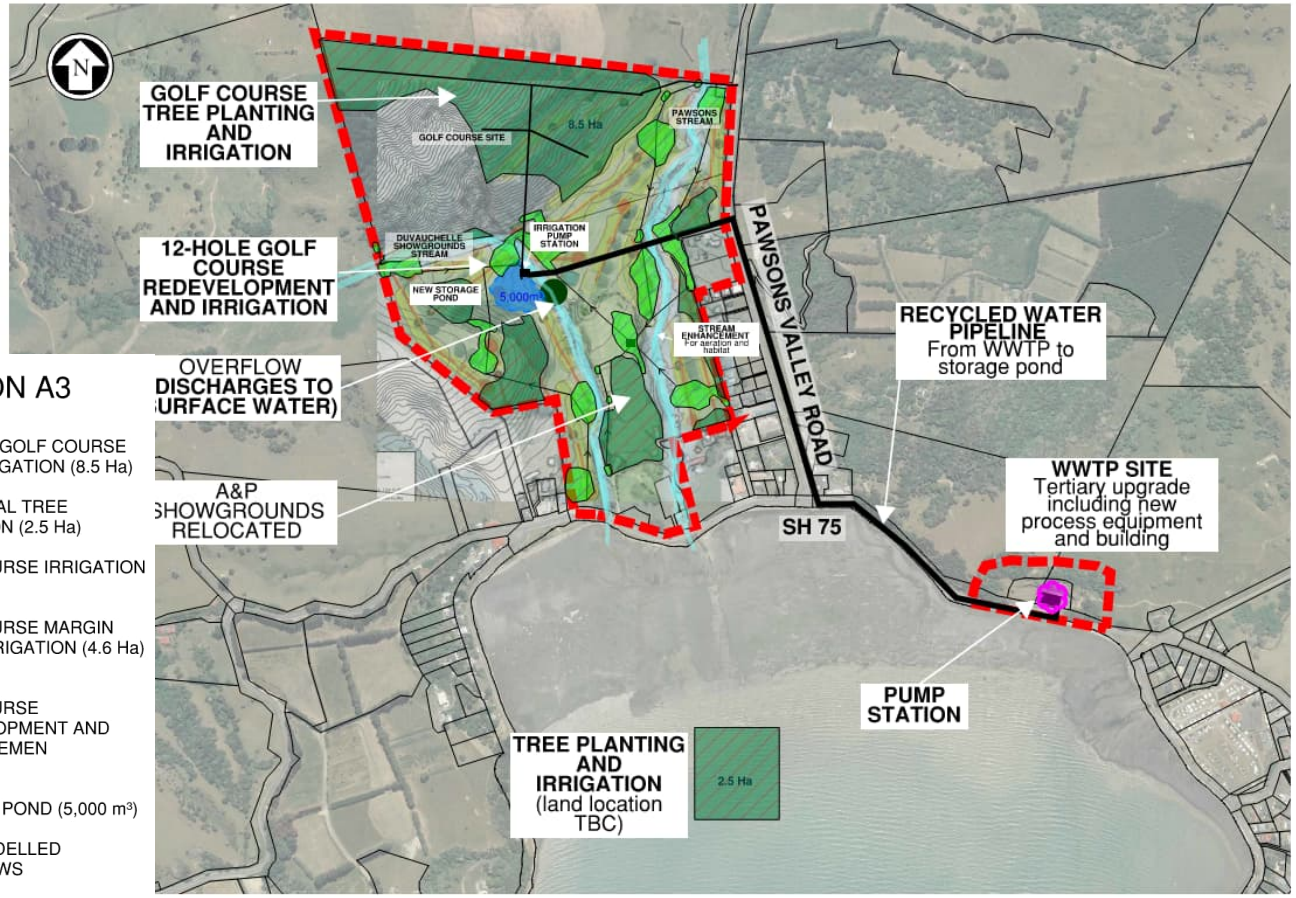
Duvauchelle WW Treatment and Disposal Renewal Scheme 24/03/2022

Christchurch City Council

Sensitivity: General

Options subject to Committee's Decision – A3

Irrigate wastewater onto trees, greens and approaches onto a redeveloped 12 hole golf course plus margin areas and neighbouring land



OPTION A3

UPSLOPE GOLF COURSE TREE IRRIGATION (8.5 Ha)

ADDITIONAL TREE IRRIGATION (2.5 Ha)

GOLF COURSE IRRIGATION (3.7 Ha)

GOLF COURSE MARGIN TREES IRRIGATION (4.6 Ha)

GOLF COURSE REDEVELOPMENT AND ENHANACEMEN

STORAGE POND (5,000 m³)

ZERO MODELLED OVERFLOWS

Wastewater flow basis:
- Duvauchelle WWTP flow data Nov2018-October 2020
- Historic climate data from 49-year period
- Resident population assumed to remain constant, holiday population to increase 33%
- Improvements to wastewater network assumed to reduce both Rain Derived Infiltration (RDI) and Ground Water Derived Infiltration (GWI) by 20%

Irrigation Model Basis
- Historic climate data from 49-year period
- Dripper irrigation to trees (assumed moderate drainage area) at 1mm/day

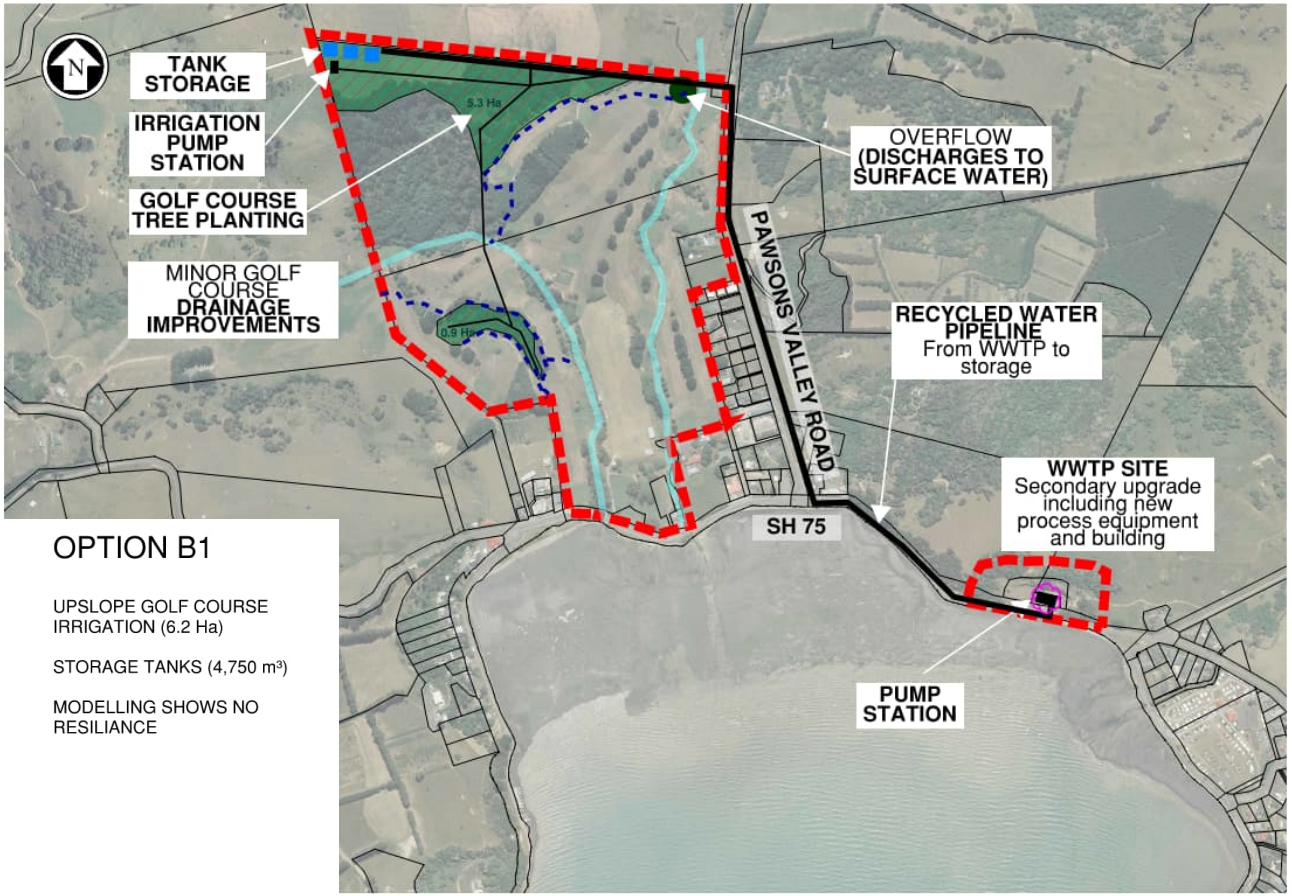
$26M ($31M NPV)

Christchurch City Council

Sensitivity: General

Options subject to Committee's Decision – B1

Irrigate planted course margins including upslope area – retain 18 holes with storage on the golf course



$9M ($13M NPV)

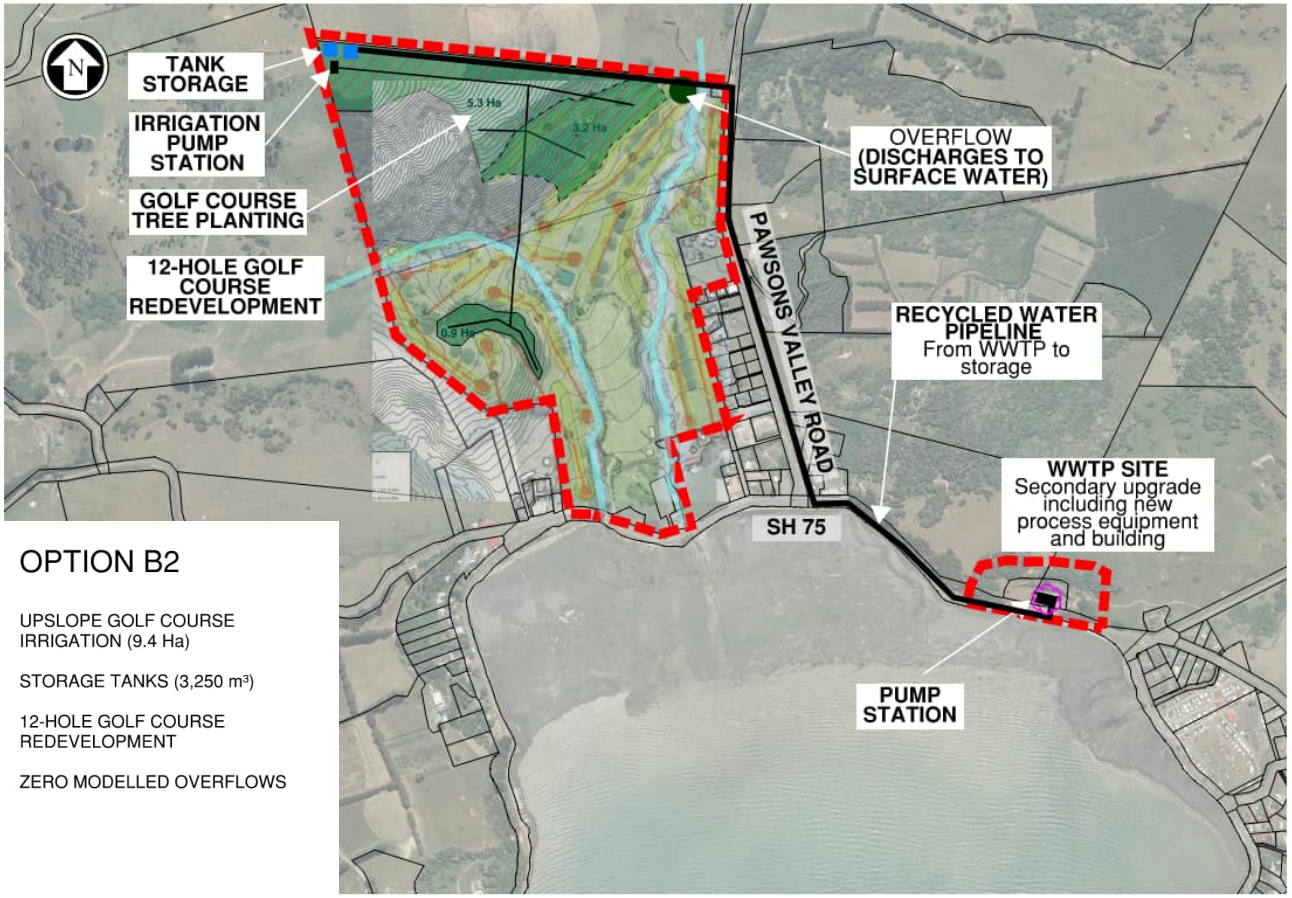
Duvauchel

Christchurch City Council

Sensitivity: General

Options subject to Committee's Decision – B2

Irrigate planted course margins including upslope area – reduce course to 12 holes with storage on the golf course



OPTION B2

UPSLOPE GOLF COURSE IRRIGATION (9.4 Ha)

STORAGE TANKS (3,250 m³)

12-HOLE GOLF COURSE REDEVELOPMENT

ZERO MODELLED OVERFLOWS

EXTENT OF SITE
WATERWAY
NEW PIPEWORK
WATER STORAGE
NEW BUILDINGS / PUMP STATIONS
WETLANDS
TREE PLANTING IRRIGATION AND DRAINAGE
FAIRWAY AND SURROUNDS IRRIGATION AND DRAINAGE
WWTP MAJOR UPGRADE
WWTP MINOR UPGRADE
DRAINAGE UPGRADES

astewater flow basis:
)uvauchelle WWTP flow data Nov2018-October 2020
listoric climate data from 49-year period
lesident population assumed to remain constant,
liday population to increase 33%
nprovements to wastewater network assumed to
luce both Rain Derived Infiltration (RDI) and Ground
ater Derived Infiltration (GWI) by 20%

gation Model Basis
listoric climate data from 49-year period
)ripper irrigation to trees (assumed moderate
ainage area) at 1mm/day

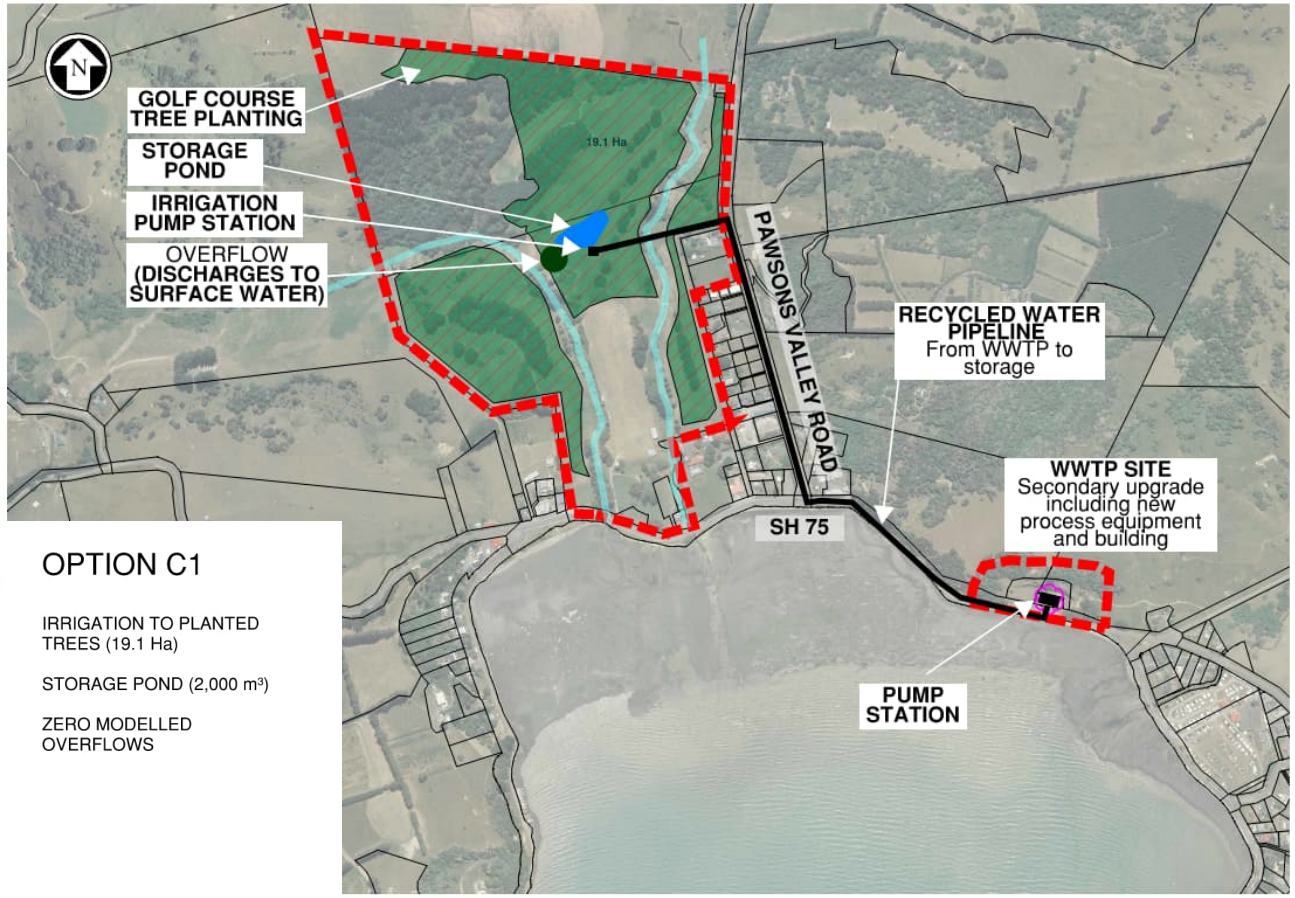
$13.5M ($19M NPV)

Duvauchel

Christchurch City Council

Sensitivity: General

Options subject to Committee's Decision – C1 Dis-establish golf course and irrigate wastewater onto trees on the golf course land



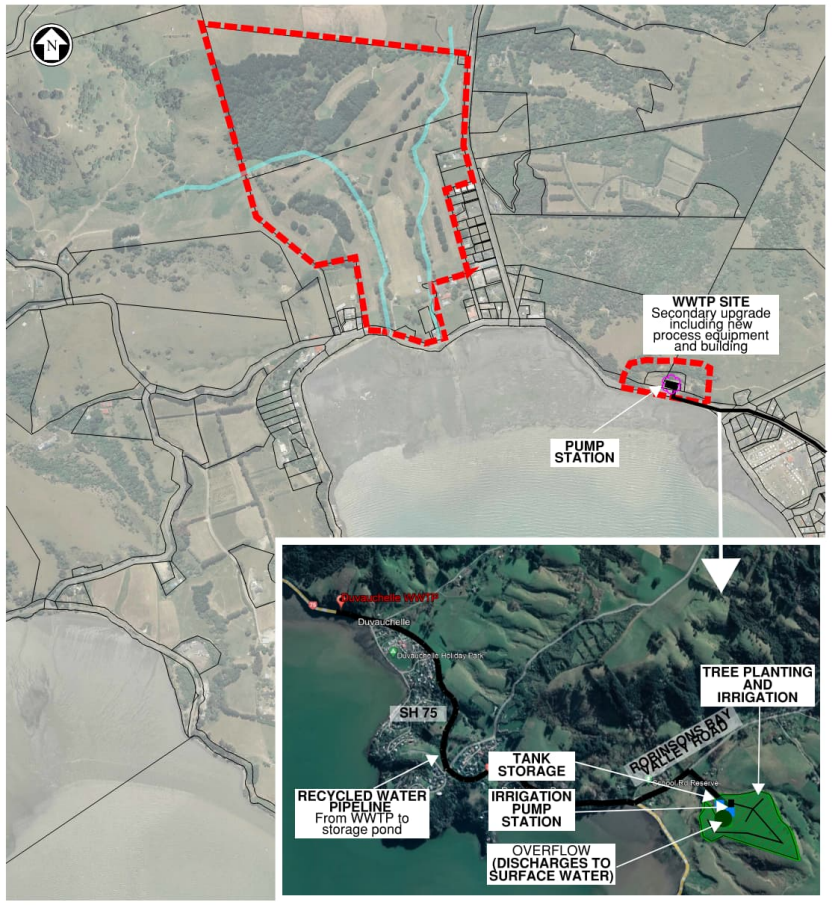
$8M ($12M NPV)

Duvauchel

Christchurch City Council

Sensitivity: General

Options subject to Committee's Decision – D3 Irrigate land in Robinsons Bay (separate to Akaroa scheme land)



EXTENT OF SITE
WATERWAY
NEW PIPEWORK
WATER STORAGE
NEW BUILDINGS / PUMP STATIONS
WETLANDS
TREE PLANTING IRRIGATION AND DRAINAGE
FAIRWAY AND SURROUNDS IRRIGATION AND DRAINAGE
WWTP MAJOR UPGRADE
WWTP MINOR UPGRADE
DRAINAGE UPGRADES

Wastewater flow basis:
- Duvauchelle WWTP flow data Nov2018-October 2020
- Historic climate data from 49-year period
- Resident population assumed to remain constant, holiday population to increase 33%
- Improvements to wastewater network assumed to reduce both Rain Derived Infiltration (RDI) and Ground Water Derived Infiltration (GWI) by 20%

Irrigation Model Basis
- Historic climate data from 49-year period
- Dripper irrigation to trees (assumed moderate drainage area) at 1mm/day

OPTION D3

TREE IRRIGATION (11 Ha)

STORAGE TANKS (TBC ASSUMED 3,000 m³)

ZERO MODELLED OVERFLOWS

$10M ($13M NPV)

Duvauchel

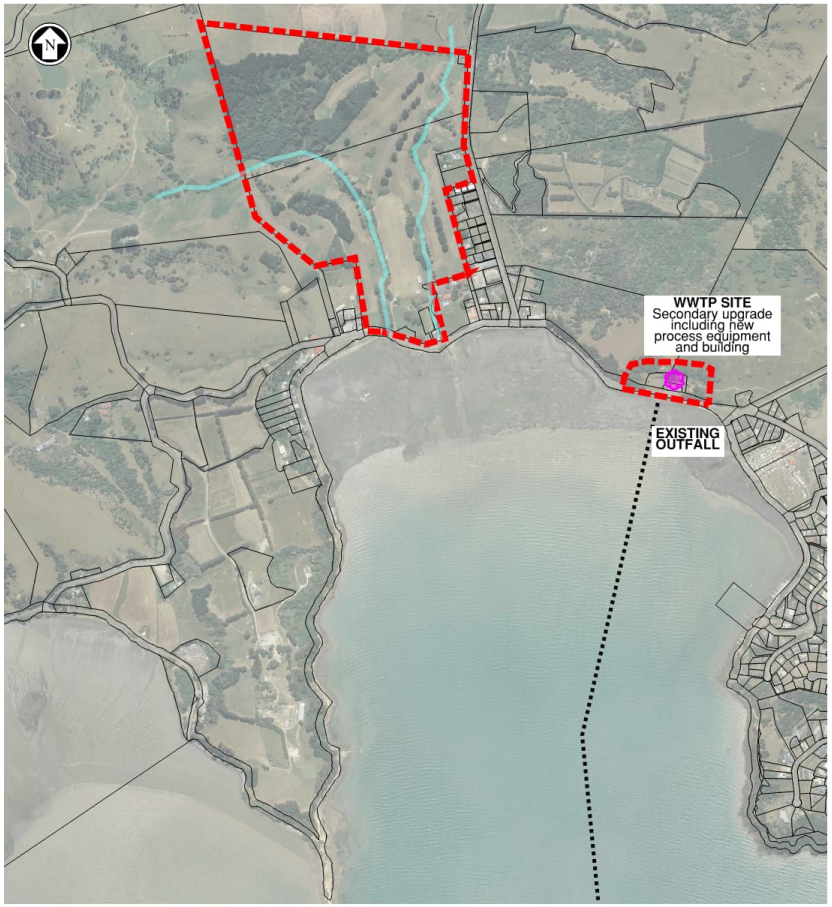
Christchurch City Council

Christchurch City Council

Sensitivity: General

Options subject to Committee's Decision – E1 Continue to Discharge to Harbour

OPTION E1



EXTENT OF SITE
WATERWAY
NEW PIPEWORK
WATER STORAGE
NEW BUILDINGS / PUMP STATIONS
WETLANDS
TREE PLANTING IRRIGATION AND DRAINAGE
FAIRWAY AND SURROUNDS IRRIGATION AND DRAINAGE
WWTP MAJOR UPGRADE
WWTP MINOR UPGRADE
DRAINAGE UPGRADES

Wastewater flow basis:
- Duvauchelle WWTP flow data Nov2018-October 2020
- Historic climate data from 49-year period
- Resident population assumed to remain constant, holiday population to increase 33%
- Improvements to wastewater network assumed to reduce both Rain Derived Infiltration (RDI) and Ground Water Derived Infiltration (GWI) by 20%

Irrigation Model Basis
- Historic climate data from 49-year period
- Dripper irrigation to trees (assumed moderate drainage area) at 1mm/day

$5M ($7M NPV)

Duvauchel

Christchurch City Council

Sensitivity: General

Options – Not recommended

Ref.	Option	Staff suggestion for consultation shortlist
A1	Irrigate wastewater onto tees, greens and approaches on a redeveloped 12 hole golf course and add a wetland	**Not recommended** due to very high costs, nutrient impacts on stream (NPSFM) and difficult to consent.
A2	Irrigate wastewater onto tees, greens and approaches on a redeveloped 12 hole golf course and also irrigate margin areas	**Not recommended** as similar to A1 and even higher costs
D1	Irrigate wastewater onto land at the Head of the Bay	**Not recommended** as other options available with similar outcome for lower cost and avoid Silent File issue
D2	Irrigate land elsewhere on the western side of Akaroa Harbour Basin	**Not recommended** as other options available with similar outcome for lower cost

Sensitivity: General

Indicative Timeline

Item	Description	Date
1	Briefing to Community Board and to the council	28 Mar 2022, 6 Apr 2022
2	Public Consultation	12 May 2022 to 15 Jun 2022
3	Hearing	Jul 2022
4	Council Decision	11 Aug 2022 or 8 Sep 2022
5	Prepare for Consent application and lodge the application	Nov 2022 to Aug 2023

Sensitivity: General

Thank you – any Questions

Christchurch City Council

Ōnuku Rūnanga Inc Soc.
P O Box 25,333 City East,
Christchurch 8141
Phone: 03 381 2082
www.onuku.iwi.nz

5 April 2022
cc: [redacted]

Tēnā koutou katoa,

Representatives of our Rūnanga have been involved from the outset in the working party discussions as options for Duvauchelle wastewater have been developed. I have also appreciated being kept fully informed when our attendance at meetings has not been possible due to other commitments. We greatly appreciate the strong consideration of options that do not entail a discharge to water.

We agree with the two options recommended for inclusion in the consultation, as they both maintain the golf course as a community facility as 18 holes in line with the community wishes. Our preference would be to beneficially reuse the treated wastewater in Duvauchelle particularly as this would reduce water taken from the stream at times of the year when flows are lowest, but understand that Council must balance these factors with cost. Reuse of the treated wastewater is sound forward thinking in these uncertain climate times.

You will already know our views on discharge to harbour which is supported by your Integrated Water Stategy, or on any options that increase the risk of intermittent discharge to natural water. We would not be in favour of disestablishing the golf course, or going against community wishes to change the course to a 12 hole option. We would not be in favour of discharge on the land at the head of the harbour at Onawe given the history of this site and believe that any further use of Robinsons Bay land would also be problematic for that community.

We would not have a problem if Council did decide to consult on just one option, the reuse of the water on the golf course, as this would speed the process to a conclusion that all the community groups seem to be in favour of. While the process to this point has taken a long time, the options have been well considered and communicated and we have appreciated being a part of this process. Thanks to the staff and consultants involved.

Nāhaku noa, nā

R H Tainui

Rik Tainui
Chairperson
Ōnuku Rūnanga Inc Soc

Memo

Date: 4 April, 2022
From: Michele McDonald, Acting Planning & Delivery Manager
To: Mayor and Councillors
Cc: Executive Leadership Team
Reference: 22/430004

Duvauchelle Wastewater - Strategic approach

1. Purpose of this Memo

1.1 To provide an overview of the policy framework for cultural considerations when considering the options for the disposal of wastewater from Duvauchelle. A report on the options is being considered by the Three Waters, Infrastructure and Environment Committee on 6th April.

2. Update

2.1 The Mahaanui Iwi Management Plan (2013) is an expression of kaitiakitanga and rangitiratanga reflecting the collective efforts of the six Papatipu Rūnanga : Ngāi Tūāhuriri Rūnanga, Te Hapū o Ngāti Wheke (Rāpaki), Te Rūnanga o Koukourārata, Ōnuku Rūnanga, Wairewa Rūnanga, and Te Taumutu Rūnanga .

2.2 The plan provides a values based policy framework for the protection and enhancement of Ngāi Tahu values and has the mandate of the six Papatipu Rūnanga. As such, it is applicable to policy and planning processes under the Resource Management Act (RMA) 1991.

2.3 Section *5.3 Wai Maori* focuses on water, a significant cultural resource.

2.4 There are 7 objectives for water and two are pertinent here:

(3) Water and land are managed as interrelated resources embracing the practice of Ki Uta Ki Tai, which recognises the connection between land, groundwater, surface water and coastal waters.
(5) Land and water use in the takiwā respects catchment boundaries, and the limits of our land and freshwater resources.

2.5 There are cultural issues associated with the unnatural mixing of water between and within catchments. These are specifically addressed by the following policies::

WM10.1 In principle, the unnatural mixing of water from different sources between or within catchments is culturally inappropriate.

WM10.2 Water infrastructure proposals that will result in the unnatural mixing of waters will be assessed by Papatipu Rūnanga on a case by case basis, allowing for consideration of:
(a) The varying perspectives of different hapū to the unnatural mixing of waters in their takiwā;
(b) The current state of water quality, water quantity, indigenous biodiversity and other cultural values within particular waterways; and
(c) Different mixing scenarios, including provisions to avoid or mitigate cultural issues and/or provide cultural benefit.

WM10.3 The cultural acceptability of proposals that will result in the unnatural mixing of waters will be assessed using the following framework:
(a) The unnatural mixing of water is likely to be culturally unacceptable where it involves:
(i) direct mixing between glacial, rain or spring fed waters,
(ii) direct mixing of waters used for different purposes;
(iii) direct mixing of water between different catchments; or
(iv) direct mixing of water from different aquifers.

(b) The unnatural mixing of waters may be acceptable where it involves:
(i) Waters that already mix naturally within the same catchment;
(ii) Waters that are of same type (e.g. rainfed to rainfed); or
(iii) Waters that are filtered through natural processes, such as natural or constructed wetlands and riparian margins.

2.6 The Iwi Management Plan also has Section *6.8 Akaroa Harbour* addressing the issues of particular significance for the harbour, with the first objective being:

(1) Elimination of discharges of contaminants to Akaroa Harbour.

2.7 The following policies are relevant for wastewater:

A1.1 To support incentives and initiatives to reduce the volume of wastewater entering the system, as per general policy on Waste minimisation (Section 5.4, Issue P7), including but not limited to:
(a) Requiring on site stormwater treatment and disposal to avoid stormwater entering the wastewater system.

A1.2 To require the elimination of the discharge of wastewater to Akaroa Harbour, as this is inconsistent with Ngāi Tahu tikanga and the use of the harbour as mahinga kai. This includes:
(a) Direct discharge from treatment plants;
(c) Wastewater coming back into harbour with tides and currents (if pumping out of harbour via pipeline).

A1.3 Wastewater should be treated and irrigated to land; subject to the following conditions:
(a) Effluent is treated to the highest possible standard;
(b) The land used as a receiving environment is suited to the nature and volume of discharge, to avoid run off or groundwater contamination;
(c) The land used as a receiving environment is used productively, in a way that is conducive to assimilating waste, such as native or exotic timber plantation; and
(d) Monitoring programs include both water and soil, and include clear strategies for responding to negative monitoring results.

A1.4 To assess potential sites for discharge to land with the following considerations:
(a) Cultural landscape values;
(b) Slope of site;
(c) Proximity to surface waterways, wetlands, waipuna;
(d) Proximity to coast;
(e) Type of soil (assimilative capacity); and

(f) Current and potential land use.

A1.5 To avoid locating a wastewater treatment plant at:

(a) Takapūneke;

(b) Near Ōnuku marae;

(c) Near waterways; or

(d) Near sites identified by tāngata whenua as wāhi tapu.

A1.6 To adopt a holistic and creative approach to finding a solution for wastewater management in the Akaroa Harbour area, including but not limited to:

(a) Recognising and providing for the cumulative effects of discharges on the harbour, as opposed to assessing effects of individual discharges;

(b) Minimising the volume of wastewater produced (Policy A1.1);

(c) Recognising and providing for future urban growth and rural land use change;

(d) Providing increased weight to cultural, social and environment costs and benefits, including costs for future generations; and

(e) Affording equal weighting to those cultural effects that may be intangible (e.g. effects on tikanga) with effects identified and measured by western science.

A1.7 If no local solution to wastewater can be found, then wastewater should be transported to Christchurch City and discharged via the existing ocean outfall.

A1.8 To support the granting of short-term consent of no more than 5 years, for renewal of consent for the discharge of wastewater to the harbour, to enable investigation, evaluation and development of discharge to land options.

A1.9 To require regular monitoring of the cultural health of the harbour, including sampling of kaimoana species at locations, until discharges of wastewater to the harbour cease.

2.8 The objectives and policies of the Iwi Management Plan have been reflected in Te Wai Ora o Tāne, our Integrated Water Strategy (2019), which is quite specific about the preferred approach to the issues in Akaroa Harbour:

Agree with Ngāi Tahu and the community on long term solution for treated wastewater in Akaroa Harbour:

We have been working on an upgrade for the Akaroa wastewater scheme and its discharge to address the ongoing concern from the local community, including Ōnuku and Wairewa Rūnanga, about the current treatment plant location at Takapūneke and the discharge of treated wastewater directly into Akaroa Harbour. The community and local rūnanga have expressed strong preferences for treated wastewater to be available for non-potable reuse and irrigation to land. A new wastewater treatment plant on an alternative site above Akaroa has been consented. We are exploring alternatives to the harbour discharge.

The discharge of treated wastewater from the Duvauchelle wastewater treatment plant into Akaroa Harbour is consented until 2023. The Duvauchelle wastewater treatment plant provides secondary treatment of wastewater and ultraviolet (UV) disinfection before discharging the treated wastewater to the Harbour via a 1.6km long outfall pipeline. Consent conditions require the investigation of alternative disposal options.

3. Conclusion

3.1 There is a sound policy basis for the options recommended and good support from the community, as a result of many years of engagement and consultation, on the options for the disposal and beneficial re-use of treated wastewater from both Akaroa and Duvauchelle.

Attachments Ngā Tāpirihanga

There are no attachments to this memo.

Signatories / Ngā Kaiwaitohu

Author	Michele McDonald - Manager Planning & Delivery
Approved By	Helen Beaumont - Head of Three Waters Jane Davis - General Manager Infrastructure, Planning & Regulatory Services

Confirming the scope of the WW Akaroa and Duvauchelle treated wastewater reuse projects

Prepared: March 2022

Michele McDonald

Team Leader Asset Planning Water & Wastewater

Christchurch City Council

Contents

Introduction

- Both the WW Akaroa Reclaimed Water Treatment & Reuse Scheme (CPMS 596) and the WW Duvauchelle Treatment and Disposal Renewal (CPMS 2214) projects in the design stage.
- Consultation complete for Akaroa
- Consultation for Duvauchelle to be pursued after this meeting
- The objective of these projects are to discontinue the disposal of treated wastewater from Akaroa Harbour

Introduction

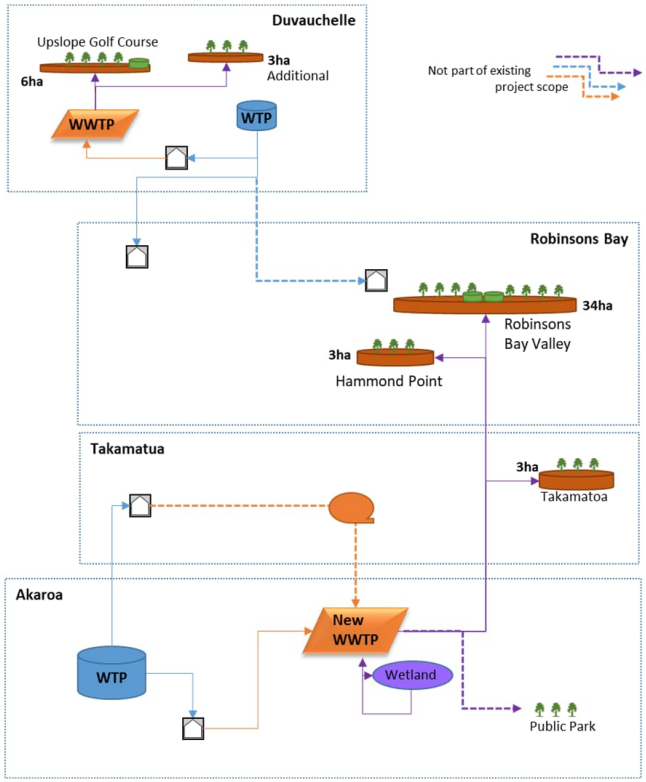
- Pursuant to the establishment of the project briefs, numerous proposals for achieving the project objectives were considered, including:
  - Pumping treated wastewater to beyond the Akaroa Harbour Heads
  - Pumping treated wastewater to Diamond Harbour, via Port Levy, and into the existing network to the Christchurch Wastewater Treatment Plant
  - Pumping treated wastewater to Halswell and into the existing network to the Christchurch Wastewater Treatment Plant
  - Pumping treated wastewater to Tai Tapu and into the existing network to the Christchurch Wastewater Treatment Plant
  - Pumping treated wastewater to an irrigation field between Tai Tapu and Little River.
- Candidates with pumping distances of greater than 15km were much more expensive than local solutions.
- These candidates also introduced consenting challenges associated with discharging wastewater from one catchment into another and discharging into watersheds with significant nutrient problems.
- Only viable proposals were taken forward for further evaluation as part of the project concept design stages.

Alternative Scope Proposals

- The Akaroa Land Reuse Scheme project team was requested to revisit the adopted land irrigation option and to consider additional proposals:
  1. To develop shared irrigation facilities for both Akaroa and Duvauchelle (already considered as part of Duvauchelle project)
  2. To combine Akaroa and Duvauchelle wastewater treatment into a single facility
  3. To connect Akaroa and Duvauchelle raw water supplies and combine drinking water treatment
  4. To send treated wastewater from Akaroa and Duvauchelle to Kaitorete Spit to discharge to sea via a terrestrial infiltration gallery (instead of irrigating to land in Akaroa and Duvauchelle)
  5. To send treated wastewater from Akaroa and Duvauchelle to Kaitorete Spit and to establish a borefield on Katoirete spit with a pipeline for a raw water supply from Birdlings Flat to Akaroa
  6. To re-use treated wastewater at Okains Bay for drinking water purposes (this candidate not further pursued due to drinking water regulations not enabling this yet)

Alternative Scope Proposals

A. Status Quo



A. STATUS QUO

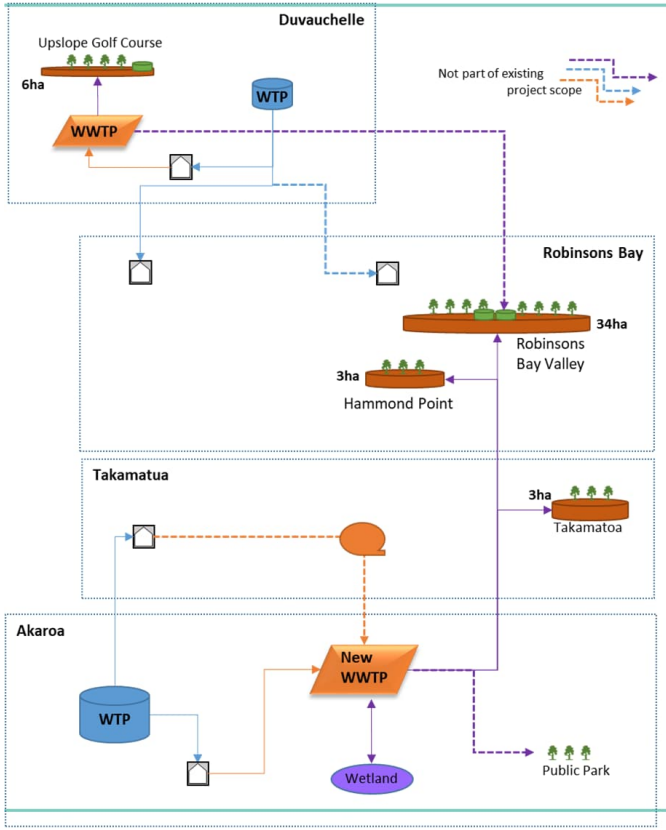
Construct and operate separate schemes.
There is no linkage between schemes.

	Item	Size	Renewal	Cost Type	TOTAL
1	Akaroa water treatment plant including new storage	2,000 m³/d	0.4%	Capex	$8,223,360
			20 years	Opex	$24,500,000
2	new Akaroa wastewater treatment incl. PS, wetland	1900 m³/d	2%	Capex	$41,480,527
			10 years	Opex	$25,998,690
3	Akaroa treated water irrigation including pipeline & storage	40 ha	2%	Capex	$27,853,040
			10 years	Opex	$1,484,105
4	Akaroa purple pipe to town to irrigate park	DN150	2%	Capex	$2,284,880
			20 years	Opex	$96,888
5	Upgraded Duvauchelle Water Treatment Plant	516 m³/d	2%	Capex	$4,055,349
			10 years	Opex	$6,860,000
6	Upgraded Duvauchelle Wastewater Treatment Plant	250 m³/d	2%	Capex	$1,932,293
			10 years	Opex	$18,130,000
7	Duvauchelle land irrigation including pipeline & storage	9 ha	2%	Capex	$10,148,215
			20 years	Opex	$566,645
8	new Robinsons Bay Valley and Hammond Point Water Supply	DN63		Capex	$3,340,000
				Opex	$0
9	new Takamatua Wastewater Scheme	6 L/s PS	2%	Capex	$10,170,000
			20 years	Opex	$2,154,646
			Total	Capex	$109,487,665
				Opex	$79,790,973
			Inflated	Capex	$116,281,954
				Opex	$182,048,589
			NPV	Capex	$106,381,914
				Opex	$35,448,302
				Total	$141,830,216

- ✓ Compliant with the Mahaanui Iwi Management Plan
- ✓ Compliant with Te Wai Ona o Tana integrated Water Strategy
- ✓ Best total cost of ownership

Alternative Scope Proposals

B. Shared Irrigation



B. SHARED IRRIGATION

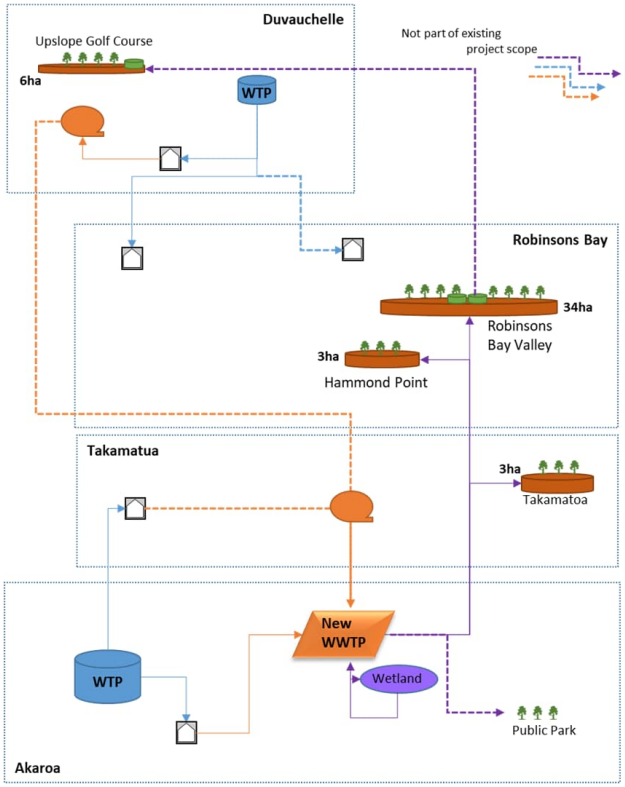
Link Duvauchelle irrigation to Robinsons Bay to provide the additional irrigation land required for Duvauchelle.

	Item	Size	Renewal	Cost Type	TOTAL
1	Akaroa water treatment plant including new storage	2,000 m³/d	0.4%	Capex	$8,023,360
			20 years	Opex	$24,500,000
2	new Akaroa wastewater treatment incl. PS, wetland	1900 m³/d	2%	Capex	$41,480,527
			10 years	Opex	$25,998,690
3	Akaroa treated water irrigation including pipeline & storage	40 ha	2%	Capex	$27,853,040
			10 years	Opex	$1,484,105
4	Akaroa purple pipe to town to irrigate park	DN150	2%	Capex	$2,284,880
			20 years	Opex	$96,888
5	Upgraded Duvauchelle Water Treatment Plant	516 m³/d	2%	Capex	$4,055,349
			10 years	Opex	$6,860,000
6	Upgraded Duvauchelle Wastewater Treatment Plant	250 m³/d	2%	Capex	$1,932,293
			10 years	Opex	$18,130,000
7a	Duvauchelle land irrigation and link to Robinsons Bay	6 ha	2%	Capex	$11,431,753
			20 years	Opex	$574,535
8	new Robinsons Bay Valley and Hammond Point Water Supply	DN63		Capex	$3,340,000
				Opex	$0
9	new Takamatua Wastewater Scheme	6 L/s PS	2%	Capex	$10,170,000
			20 years	Opex	$2,154,646
			Total	Capex	$110,571,202
				Opex	$79,798,864
			Inflated	Capex	$116,949,031
				Opex	$182,066,592
			NPV	Capex	$107,667,862
				Opex	$35,451,808
				Total	$143,119,670

- ✓ Compliant with the Mahaanui Iwi Management Plan
- ✓ Compliant with Te Wai Ona o Tana integrated Water Strategy
- ❖ Higher capital cost with little operational cost benefits
- ❖ Not favoured by the Robinsons Bay community

Alternative Scope Proposals

C. Shared WW Treatment



C. SHARED Wastewater Treatment

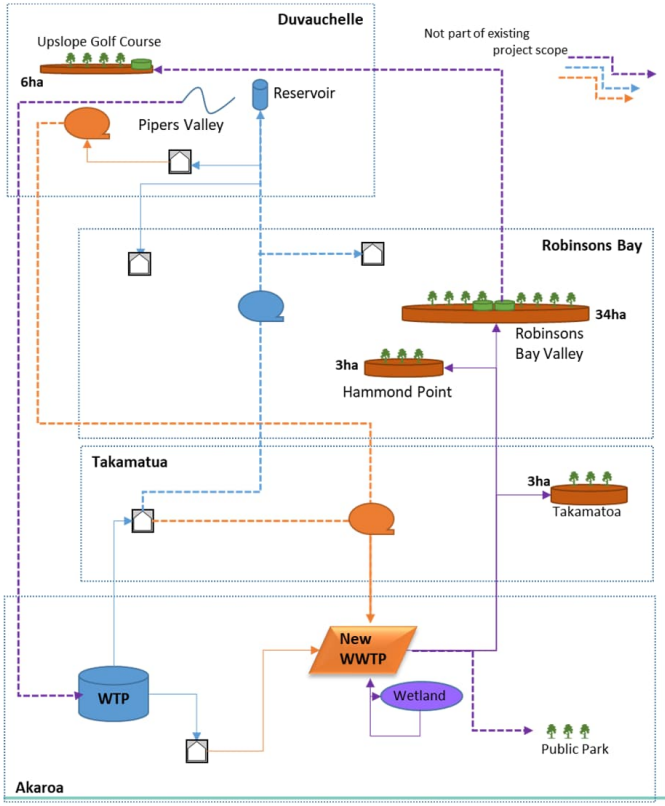
Send Duvauchelle wastewater to Akaroa for treatment and share irrigation land in Robinsons Bay and Duvuachelle

	Item	Size	Renewal	Cost Type	TOTAL
1	Akaroa water treatment plant including new storage	2,000 m³/d	0.4%	Capex	$8,223,360
			20 years	Opex	$24,500,000
2a	new Akaroa wastewater treatment incl. PS, wetland	2185 m³/d	2%	Capex	$45,705,768
			10 years	Opex	$25,998,690
3	Akaroa treated water irrigation including pipeline & storage	40 ha	2%	Capex	$27,853,040
			10 years	Opex	$1,484,105
4	Akaroa purple pipe to town to irrigate park	DN150	2%	Capex	$2,284,880
			20 years	Opex	$96,888
5	Upgraded Duvauchelle Water Treatment Plant	516 m³/d	2%	Capex	$4,055,349
			10 years	Opex	$6,860,000
6a	Duvauchelle WW pump station and pipeline to Akaroa WWTP	DN110 5,600 m	0.50%	Capex	$6,696,000
			20 years	Opex	$798,390
7a	Duvauchelle land irrigation and link to Robinsons Bay	6 ha	2%	Capex	$11,431,753
			20 years	Opex	$574,535
8	new Robinsons Bay Valley and Hammond Point Water Supply	DN63		Capex	$3,340,000
				Opex	$0
9	new Takamatua Wastewater Scheme	6 L/s PS		Capex	$10,170,000
				Opex	$2,154,646
			Total	Capex	$119,760,150
				Opex	$62,467,254
			Inflated	Capex	$126,181,272
				Opex	$142,523,334
			NPV	Capex	$116,824,006
				Opex	$27,751,988
				Total	$144,575,994

- ✓ Compliant with the Mahaanui Iwi Management Plan
- ✓ Compliant with Te Wai Ona o Tana integrated Water Strategy
- ❖ Higher capital cost with little operational cost benefits
- ❖ Less WW treatment resilience

Alternative Scope Proposals

D. Shared Treatment



D. SHARED Treatment

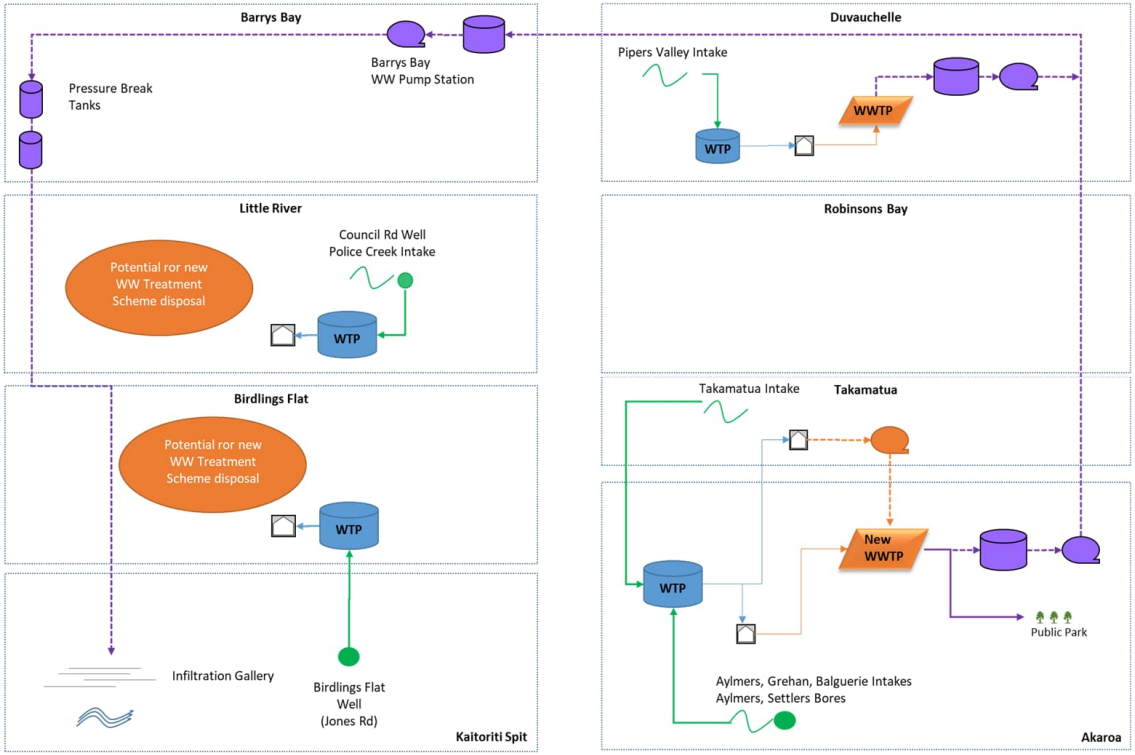
Regionalize both water and wastewater treatment at Akaroa. Provide a raw water connection from Pipers Valley to Akaroa WTP.

	Item	Size	Renewal	Cost Type	TOTAL
1a	Upgraded Akaroa Water Supply Treatment Plant	2,500 m³/d	0.4%	Capex	$13,426,720
			20 years	Opex	$24,500,000
2a	new Akaroa wastewater treatment incl. PS, wetland	2185 m³/d	2%	Capex	$45,705,768
			10 years	Opex	$25,998,690
3	Akaroa treated water irrigation including pipeline & storage	40 ha	2%	Capex	$27,853,040
			10 years	Opex	$1,484,105
4	Akaroa purple pipe to town to irrigate park	DN150	2%	Capex	$2,284,880
			20 years	Opex	$96,888
5a	Potable water from Akaroa WTP to Duvuachelle	DN150 6,380 m	2%	Capex	$7,711,200
			10 years	Opex	$0
5b	Raw water pipeline from Pipers Stream to Akaroa WTP	DN150 6,380 m	2%	Capex	$4,823,280
			10 years	Opex	$0
6a	Duvauchelle WW pump station and pipeline to Akaroa WWTP	DN110 5,600 m	0.50%	Capex	$6,696,000
			20 years	Opex	$798,390
7a	Duvauchelle land irrigation and link to Robinsons Bay	6 ha	2%	Capex	$11,431,753
			20 years	Opex	$574,535
9	new Takamatua Wastewater Scheme	6 L/s PS		Capex	$10,170,000
				Opex	$2,154,646
			Total	Capex	$130,102,640
				Opex	$55,607,254
			Inflated	Capex	$137,873,815
				Opex	$126,871,772
			NPV	Capex	$126,596,924
				Opex	$24,704,333
				Total	$151,301,256

- ✓ Compliant with the Mahaanui Iwi Management Plan
- ✓ Compliant with Te Wai Ona o Tana integrated Water Strategy
- ❖ Higher capital cost with little operational cost benefits
- ❖ Less WS and WW treatment resilience

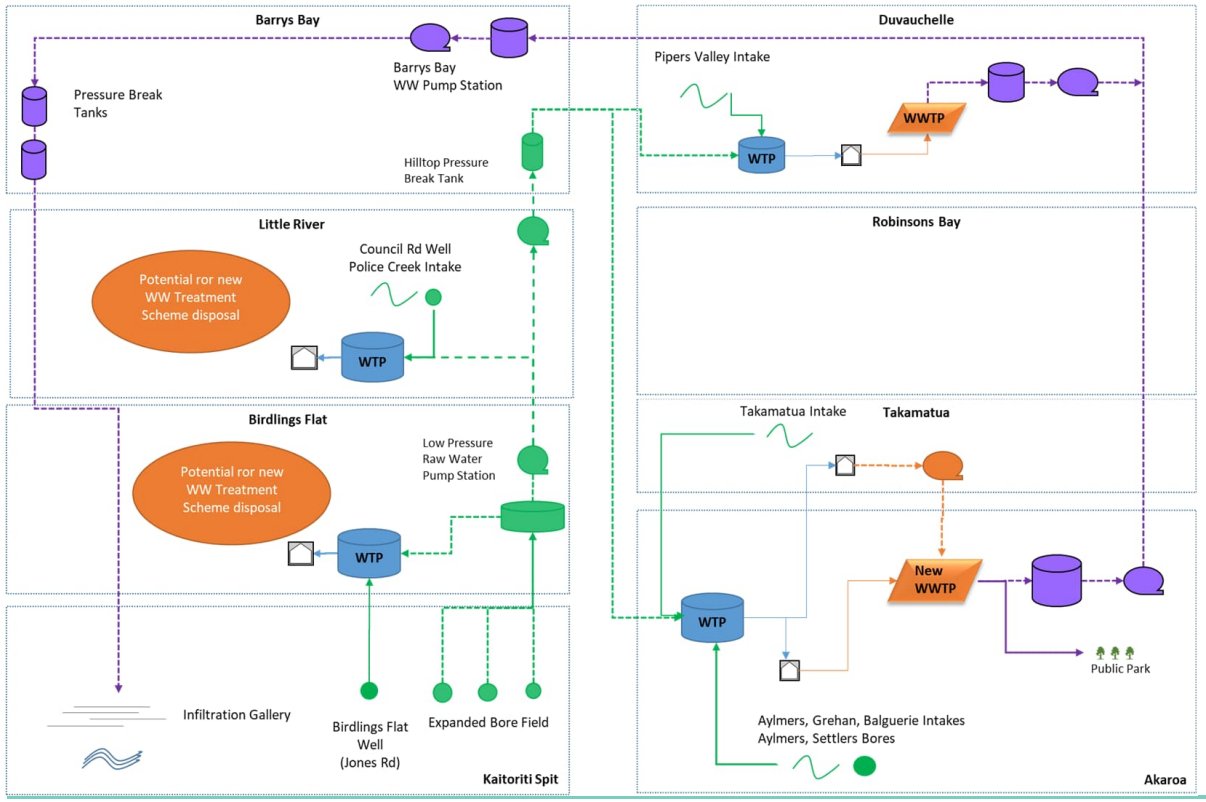
Alternative Scope Proposals

E. Akaroa to Birdlings Flat



- Water movement between catchments not in line with Mahaanui Iwi Management Plan
- No environmental re-use
- Short retention time before discharged to sea
- High consent risk
- Many operations and resilience risks with 34 km pipeline x high lift PS

Alternative Scope Proposals F. Akaroa to Birdlings Flat & Back



- Water movement between catchments not in line with Mahaanui Iwi Management Plan
- No environmental re-use
- Short retention time before discharged to sea
- High consent risk
- Many operations and resilience risks with 34 km pipeline x high lift PS x 2

Alternative Scope Proposals E. Birdlings Flat integration WW

E. Akaroa to Birdlings Flat

Do not irrigate to land in Akaroa but pump treated water to the Kaitorete Spit area and discharge to sea via a terrestrial infiltration gallery

	Item	Size	Renewal	Cost Type	TOTAL
1	Akaroa water treatment plant including new storage	2,000 m³/d	2.0%	Capex	$8,223,360
			10 years	Opex	$24,500,000
2	new Akaroa wastewater treatment incl. PS, wetland	1900 m³/d	2%	Capex	$41,480,527
			10 years	Opex	$25,998,690
3a	Akaroa to Kaitorete Split treated wastewater pipeline & storage	DN150	0.50%	Capex	$67,234,431
		36km	10 years	Opex	$10,273,844
4	Akaroa purple pipe to town to irrigate park	DN150	2%	Capex	$2,284,880
			20 years	Opex	$96,888
5	Upgraded Duvauchelle Water Treatment Plant (as per Option A)	516 m³/d	2%	Capex	$4,055,349
			10 years	Opex	$6,860,000
6	Upgraded Duvauchelle Wastewater Treatment Plant	250 m³/d	2%	Capex	$1,932,293
			10 years	Opex	$18,130,000
9	new Takamatua Wastewater Scheme	6 L/s PS		Capex	$10,170,000
				Opex	$2,154,646
			Total	Capex	$135,380,840
				Opex	$88,014,067
			Inflated	Capex	$142,808,283
				Opex	$200,810,143
			NPV	Capex	$131,928,162
				Opex	$39,101,531
				Total	$171,029,693

- Higher capital and operating cost, resulting in a higher 50 year NPV +$30 million (E) and + $80 million (F)

F. Akaroa to Birdlings Flat and back

Do not irrigate to land in Akaroa but pump treated water to the Kaitorete Spit area and discharge to sea via a terrestrial infiltration gallery. Develop a bore field and supply raw water back to Duvauchelle and Akaroa.

	Item	Size	Renewal	Cost Type	TOTAL
1	Akaroa water treatment plant including new storage	2,000 m³/d	0.4%	Capex	$8,223,360
			20 years	Opex	$24,500,000
2	new Akaroa wastewater treatment incl. PS, wetland	1900 m³/d	2%	Capex	$41,480,527
			10 years	Opex	$25,998,690
3a	Akaroa to Kaitorete Split treated waste water pipeline	DN150	0.50%	Capex	$67,234,431
		36km	10 years	Opex	$10,273,844
4	Akaroa purple pipe to town to irrigate park	DN150	2%	Capex	$2,284,880
			20 years	Opex	$96,888
5c	Duvauchelle Water Treatment Plant (no upgrade)	516 m³/d	2%	Capex	$300,396
			10 years	Opex	$6,860,000
6	Upgraded Duvauchelle Wastewater Treatment Plant	250 m³/d	2%	Capex	$1,932,293
			10 years	Opex	$18,130,000
9	new Takamatua Wastewater Scheme	6 L/s PS		Capex	$10,170,000
				Opex	$2,154,646
10	Raw water supply from Birdlings Flat to Akaroa			Capex	$48,410,144
				Opex	$19,433,652
			Total	Capex	$180,036,032
				Opex	$107,447,719
			Inflated	Capex	$190,288,554
				Opex	$245,149,356
			NPV	Capex	$175,232,857
				Opex	$47,735,214
				Total	$222,968,071

Conclusion

- Scope of 2 projects can be confirmed, because:
  - Best total cost of ownership - no financial benefit in combining the Akaroa and Duvauchelle irrigation, wastewater treatment or water treatment schemes
  - Meets the objectives of Te Wai Ona o Tana integrated Water Strategy and the Mahaanui Iwi Management Plan
  - Offers the best 're-use' and 'use' of water
  - Agreed by stakeholders
  - Cost significantly more to link to Birdlings Flat, Little River, etc. without providing better outcomes

	Financial	Social	Cultural	Environmental
Kaitorete Infiltration	Higher costs, with higher risks around unknown aspects due to the preliminary nature of the option.	Likely to be challenged by new communities involved and undermine work to date to resolve issues with the existing scheme. Likely to be welcomed by a smaller set of residents of the Robinsons Bay area	Likely to be opposed by Ngai Tahu due to discharge from one takiwā into another. Undermines previous decision making and unlikely to receive resource consent	Does not have environmental benefit. Short retention period before discharging to sea.
Akaroa Harbour Irrigation	Lowest cost with a high level of risk understanding	Unsupported by some members of the community, but supported by others	Option is strongly supported by Ngai Tahu as it meets cultural needs.	Has environmental benefits

Conclusion

- Concern about the water security in Banks Peninsula to be addressed in a Banks Peninsula servicing strategy (initial indications remain that regionalization will not lead to increased affordability)
- Principles and assumptions for future planning:
  - Water demand management to be rigorously pursued in the first instance
  - More emphasis to be placed on rain water storage for gardening purposes
  - Non-potable re-use of treated wastewater to be pursued next, if needed
  - Consider and lobby for the re-use of treated wastewater as a raw water source for drinking water as a last resort
  - Investigate desalination cost and implications
  - Banks Peninsula communities are not expected to grow significantly
  - Centralized schemes to be pursued only if more affordable

Implications of the Health (Fluoridation of Drinking Water) Amendment Act

Prepared: March 2022

Michele McDonald

Team Leader Asset Planning Water & Wastewater

Christchurch City Council

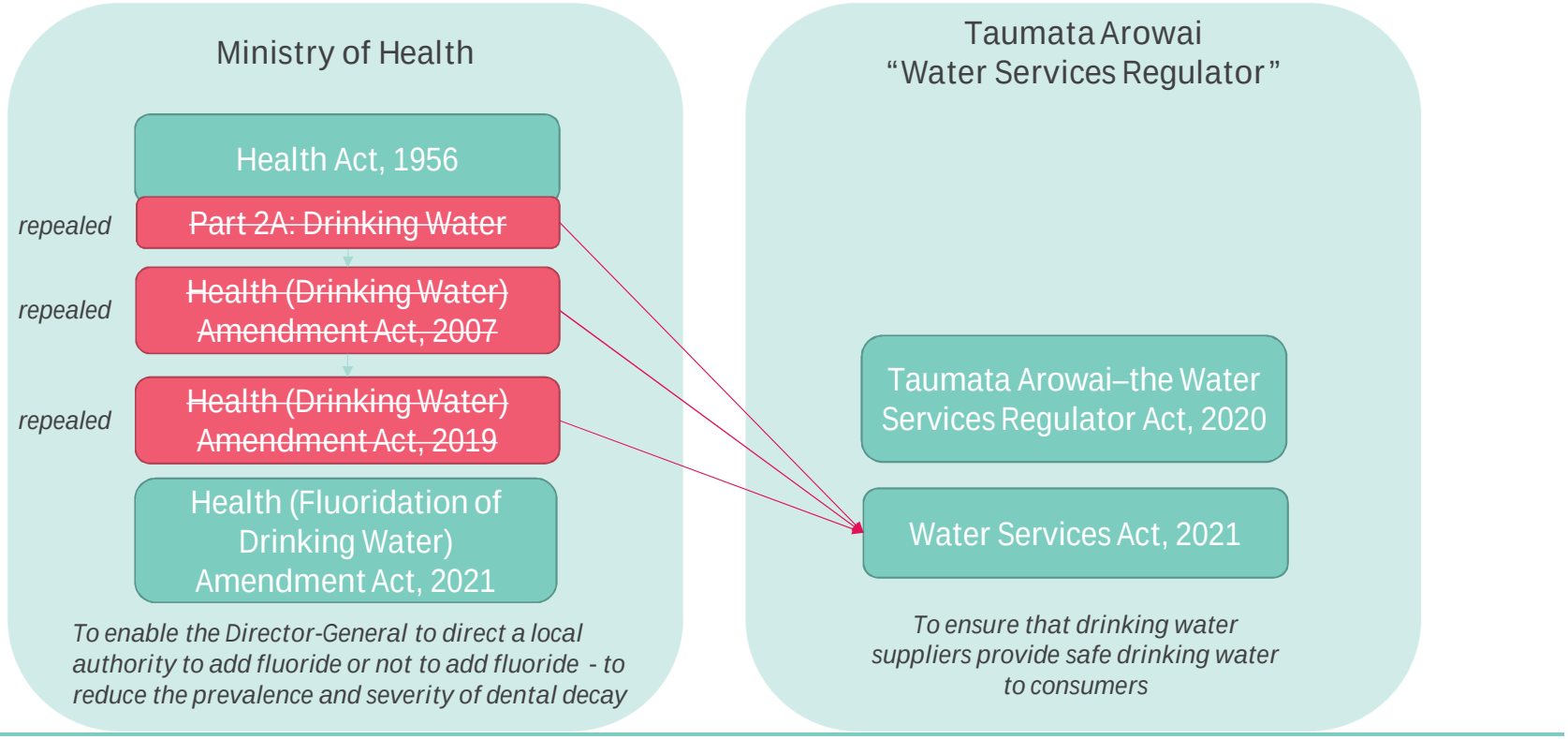
Contents

The focus of this presentation is on the technical response to the Ministry of Health regarding the requirements to implement drinking water fluoridation in Christchurch

1. Legislative Context
2. Health (Fluoridation of Drinking Water) Amendment Act (the Act)
3. MoH Information Request
4. CCC response on cost and timeframe
5. Way forward

It is recognised that water fluoridation has been used in many regions in New Zealand for over 60 years. New Zealand and international studies show that water fluoridation provides benefits over and above brushing twice daily with fluoride toothpaste and eating a healthy diet. Countries similar to New Zealand also support water fluoridation, including Australia, the United Kingdom, the USA and Canada.

Legislative Context



The Act – enacted 13 December 2021

- Director-General to direct a local authority to add fluoride or not to add fluoride to drinking water supplied through its local authority supply
- Require the local authority to comply with the direction
- Before making a direction, the Director-General must consider
  - scientific evidence
  - whether the benefits of adding fluoride to the drinking water outweigh the financial costs
- Director-General must publish the direction
  - must specify a date by which the local authority must comply with the direction
  - must specify the level at which fluoride must be added
  - may allow the local authority to supply, at 1 or more specified sites, water to which fluoride has not been added

The Act

- Before making a direction to add fluoride to drinking water, the Director-General must invite written comments from local authority
  - the estimated financial cost of adding fluoride to the drinking water, including any additional costs of ongoing management and monitoring; and
  - the date by which the local authority would be able to comply with a direction
- The Director-General must give the local authority at least 40 working days from the issuing of the invitation to provide its comments.
- If the local authority provides comments within the specified time, the Director-General must—
  - have regard to the comments; and
  - if the Director-General decides to make a direction, summarise and respond to the comments in the reasons for the decision published under section 116E(5).

Letter 15/12/21

Deadline 11/03/22

Response 10/03/22

The Act

- A local authority that receives a direction under section 116E or an invitation to comment under section 116G is not required to consult on any matter related to the direction or invitation
- Local authority must comply with direction
- Offence to contravene or permit contravention of section 116I - Subpart 2—Offences – Section 116J to Section 116N

MoH Information Request

Letter 15/12/21

- Directions will be given from mid-2022 onwards
- Staged approach to align with reforms
- Encouraged to start fluoridation-related preparatory work
- No need to wait for direction to start fluoridation
- To support, the MoH has limited amount of capital works funding available for local authorities that are willing and able to start fluoridation by end of 2022
- Will provide more information about funding when has received the information
- Recognize that complex for some – not feasible in the short term – new entities to be held responsible, if directed
- For community water supplies servicing > 500
- Information request

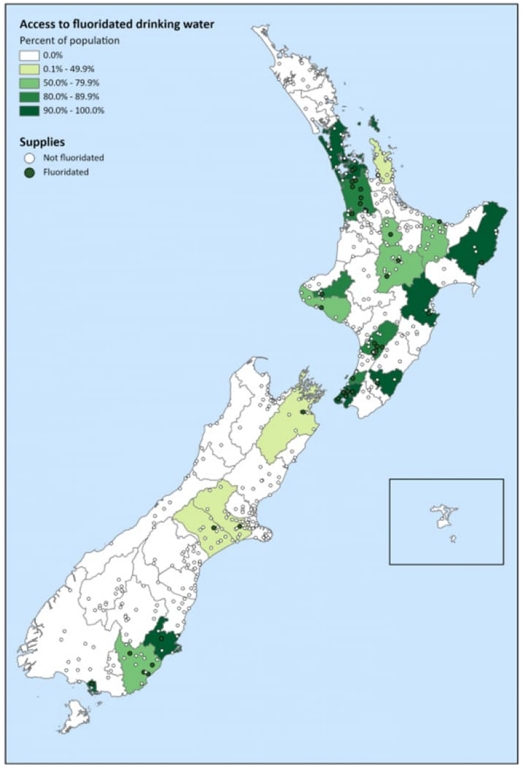
MoH Information Request

- Information request went out to 56 local authorities - 224 community drinking water supplies > 500 people that does not currently fluoridate

61% of New Zealanders on registered drinking water supplies have access to fluoridated drinking water

People in the North Island were four times more likely to have access to fluoridated drinking water than people in the South Island

Massey University, based on Ministry of Health. (2020). Annual report on drinking water quality 2018-2019. Wellington: Ministry of Health.



CCC Response

Response 10/03/22

- status: no fluoridation
- fluoridation capital works: none – 2 new PS capital projects – no provision made
- estimated capital works cost: $63 million - $1.3 million per facility - 50 locations (includes 30% contingency + 12% escalation provision)
- budgeted capital cost: NONE – the LTP focus has been on drinking water safety
- number of months required: after Annual Plan / LTP change - at least 44 months - delay of 24 to 48 months to enable completion of the many water safety projects at PSs
- other information:
  - operating cost of $1.8 million per annum
  - renewal cost $14 million in 20 years or $1.1 million per annum
  - technical complexities including site constraints
  - additional demand on scarce resources
  - limited suppliers of fluoride in Christchurch

CCC Response

- Why so expensive?
  - It is more common for other cities to have one or more sources feeding into a single water treatment plant. For example, Akaroa has six sources feeding into one water treatment plant. This configuration is more typical for other drinking water suppliers, be it on a larger scale. Larger cities may have more than one treatment plant but none have 49 locations where fluoride would need to dosed.
  - In Christchurch, water is abstracted from 5 confined aquifers into the network via several pump stations (each pump station being by up to 6 wells) spread throughout the city to match the demand. The groundwater is of such good quality, that no treatment is required. This is different from a conventional water supply (such as Akaroa) where raw water is delivered to a single water treatment facility, from where it is then distributed into the network.
  - Fluoride is generally added to water as part of the water treatment process. Where water is treated at a single location, only one dosing facility would be needed.

CCC Response

- Because Christchurch pump stations are not conventional treatment plants, the addition of fluoride becomes more complex because the system is sealed and water is pumped directly from the aquifers into the network at multiple locations. Also the pump station command and control systems have not been equipped to monitor and control treatment processes, as one would find at a conventional treatment plant, and therefore additional instrumentation and communication equipment would be required to manage the fluoridation process.

- Each of the pumps supply water into the network at variable flow rates, depending on the location of the pump station and the demand at the time. This variance further complicates the addition of fluoride since the amount of fluoride added to the system must be matched to the flow rate out of the pump station. Conventional treatment plants generally produce water at a stable rate.

- Fluoride is added to water in a liquid state through a separate dosing pump. The dosing pump needs to inject the liquid containing fluoride into the pressurized water main at each pump station. Because of the proximity of the pump stations to the network, additional mixing equipment must be installed in the pipes to ensure that the fluoride is adequately mixed with the water before it reaches the first customer.

CCC Response

- In order to make sure that the fluoride is dosed at the right concentration, multiple communication and control mechanisms must be established. There are also many safety precautions that must be put in place to make sure that the fluoride dosing rate is not exceeded. This includes a fluoride concentration analyser downstream of the dosing point.

- The fluoride tanks and dosing equipment must be protected from the environment, must be kept in a sterile state and has to comply with health and safety provisions. This means that the fluoride equipment must be housed in a separate room or building equipped with an air scrubber. We are investigating the use of different forms of fluoride that could reduce the health and safety requirements whilst ensuring that our operators are safe when adding fluoride to the storage tanks and when maintaining the fluoride dosing equipment.

CCC Response

- Why the long implementation time
  - In order to deliver the demand during summer, we cannot take pump stations out of operation during summer.
  - In order to delivery the demand outside of summer, we need enough pump stations to be operating to deliver the demand – we can therefore not work on all pump stations simultaneously.

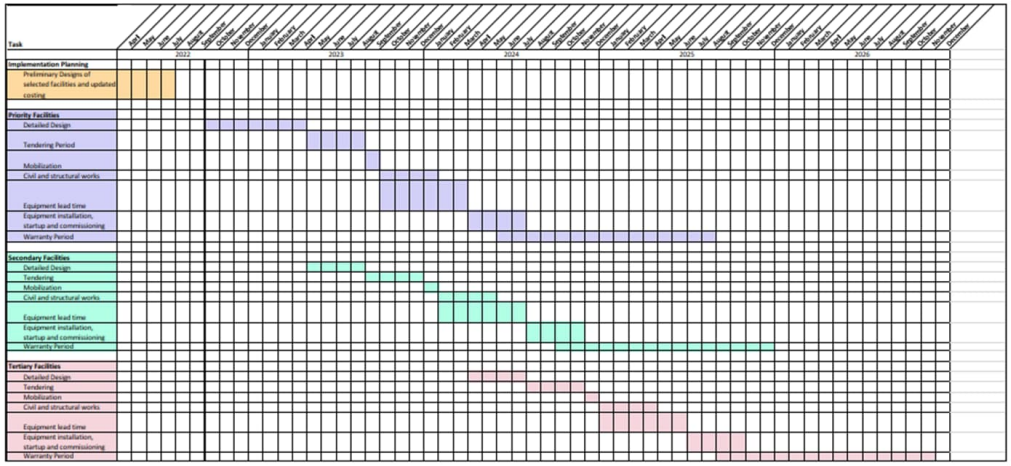


Figure 5-1. Conceptual implementation schedule

CCC Response

- Why the delay before we can start?
  - Funding needs to be secured first.
  - The reservoir and suction repair programme will take at least another 4 years to complete - this work requires pump stations to be taken off line (suction tanks) and necessitates other pump stations to be operating all the time (reservoirs) – therefore not available for us to implement fluoridation.
  - It is also about having enough contractors available to actually undertake the physical works.

REPAIR PROGRAMME	4 YEARS																
DEMONSTRABLY SAFE RESERVOIRS AND SUCTION TANK REPAIR PROGRAMME FROM INSPECTIONS																	
		REPAIR PROGRAMME			PLANNED			PLANNED			PLANNED			PLANNED			
		WSSA Inspection			WSSA Inspection			WSSA Inspection			WSSA Inspection			WSSA Inspection			
PROGRAMME		2021			2022			2023			2024			2025			
		REPAIR WORK LEVELS			REPAIR WORK LEVELS			REPAIR WORK LEVELS			REPAIR WORK LEVELS			REPAIR WORK LEVELS			
	Asset Type	No. of Assets	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 1	LEVEL 2	LEVEL 3	TOTAL
	Reservoirs	105	8	4	3	0	0	8	32	12	12	32	12	12	33	12	12	120
	Suction Tanks	24							12	6	3	12	6	3				42
	PS with no Storage	95																
	Fire Tank	3				1			1			1			1			3
	Water Tank	1	1															0
	TOTAL	228	9		3	1		8	45		15	45		15	34		12	165

Way forward

- Staff is continuing to Phase 2 of the concept plan → preliminary design at 5 locations to refine costing, agree concept
- Will need feedback from the Ministry of Health on the information submitted and whether funding will be available / whether a direction will be given now or form part of the water reform process
- If a direction to start fluoridation is received → a Long Term Plan change will be needed and depending on the direction, may require an Annual Plan change amounting to $63 million capex and $1.8 million opex (excluding renewal provision of $1.1 million per annum)

References

- trim://22/336548: Implications of the Health (Fluoridation of Drinking Water) Amendment Act 2021 for Christchurch water supplies, Three Waters Infrastructure and Environment Committee, 6 April 2022
- trim://22/305427: MoH information request entitled "Action Required – Planning for community water fluoridation"
- trim://22/316668: Technical Memorandum, Fluoride Implementation – Preliminary Cost Estimate Update, Jacobs, 10 March 2022
- trim://22/338209: Response on Community Water Fluoridation Information Request, Christchurch City Council, General Manager: Infrastructure, Planning and Regulatory Services, 10 March 2022
- trim://22/20484: Code of Practice, Fluoridation of Drinking-Water Supplies in New Zealand, Water New Zealand, First Edition, December 2014