Submission No: 998

CHRISTCHURCH CITY COUNCIL
Akaroa Wastewater Scheme

- Received via Have Your Say -

Submissions close 5pm, 30 April 2017

Full Name*:	Matthew Reid
Contact Address*:	
Postcode:	
Telephone number:	
Email Address:	
Date Sent:	4/29/2017 4:23:41 PM
Would you like to attend the hearings for this consultation?	No
I am completing this submission:	For myself
Role within Organisation	
Group/Organisation Names	
How many people do you represent?	
Preferred environment for Akaroa wastewater discharge:	Disposal via a new outfall pipeline to the mid-harbour
If Other, please describe and state reasons	Least change from the existing scheme. Most logical Cost effective.
Option 1	Option 5 - Disposal via a new outfall pipeline to the mid-harbour
Option 2	Please select
Option 3	Please select
Option 4	Please select
Option 5	Please select
Option 6	Please select
Other	
State reasons for ranking	Option 5 appears to be the only logical option that will not have environment effects much greater that the ones we currently know of witht he existing system.
Would you be more supportive of spray irrigation of treated wastewater to pasture? Why	No knowledge in this area

Do you have location preference? Why:	
Should Council add aspirational projects to the Akaroa wastewater scheme?	
Any other comments?	

Submission No: 1002

CHRISTCHURCH CITY COUNCIL
Akaroa Wastewater Scheme

- Received via Have Your Say -

Submissions close 5pm, 30 April 2017

Full Name*:	Suky Thompson
Contact Address*:	
Postcode:	
Telephone number:	
Email Address:	
Date Sent:	4/29/2017 11:25:08 PM
Would you like to attend the hearings for this consultation?	Yes
I am completing this submission:	For myself
Role within Organisation	
Group/Organisation Names	
How many people do you represent?	
Preferred environment for Akaroa wastewater discharge:	Other
If Other, please describe and state reasons	Beneficial reuse See attached submission
Option 1	Option 4 - Non-potable reuse in Akaroa, in combination with another option
Option 2	Option 5 - Disposal via a new outfall pipeline to the mid-harbour
Option 3	Please select
Option 4	Please select
Option 5	Please select
Option 6	Please select
Other	
State reasons for ranking	The water should be reused where it is most needed. That is in Akaroa. A harbour outfall should be used for the residual water until such time as 100% reuse is established.
Would you be more supportive of spray irrigation of treated wastewater to pasture? Why	Location dependent. Spray at Pompeys Pillar because that is in line with the owners. Trees elsewhere. Gardens and parks and toilets in Akaroa

Do you have location preference? Why:	Pond Site 10
Should Council add aspirational projects to the Akaroa wastewater scheme?	Fireponds, not reticulation.
Any other comments?	

Akaroa Reclaimed Water Beneficial Reuse, Treatment and Disposal Options Submission

Suky Thompson
[redacted]

Introduction

1. I have lived in Robinsons Bay for over 25 years and spent many years involved with and contributing to community affairs and environmental issues in Robinsons Bay, Akaroa and the wider Peninsula area in a voluntary and professional capacity.
2. I am concerned about the impact of the current wastewater land disposal proposal on the community of Robinsons Bay, the general amenity of Robinsons Bay and the direct impacts on community members whose properties have been earmarked for ponds or irrigation and those in close proximity.
3. I have participated in and listened to community views at 13 meetings since becoming involved in the issue in October 2016 when Robinsons Bay was first publicly proposed for land disposal. I have put in hundreds of hours of my time working on and thinking about the issue since. I was one of the group that developed the *Community Strategy toward an Acceptable solution to the disposal of Akaroa Wastewater* to assist the Council to find a positive way forward, and subsequently represented Robinsons Bay on the Akaroa Wastewater Working Party through Friends of Banks Peninsula.
4. I support the Friends of Banks Peninsula submission. I have been a member of the organisation for many years. I am currently its Deputy Chair and a principal author of its submission.
5. In this personal submission, I explain my concern that the “disposal” perspective the Council has taken to date and the processes it has followed leave it at risk of implementing an expensive and high risk system, with huge upfront costs, repeating mistakes of the past and failing to provide a sustainable outcome for the future.
6. It is a credit to the Community Board that they listened to the community concerns and established the Working Party. This gave an opportunity for parties representing Ngāi Tahu and the communities affected by the land disposal proposals an opportunity to explore different ideas.
7. The addition of Option 4 – Non-potable reuse in Akaroa is a result of the Working Party and represents a significant departure from the “disposal” perspective. I urge the Council to continue developing this idea and to look for additional ways to complement it with beneficial reuse, particularly in Akaroa where the need is the greatest, and the potable water supply most limited.
8. I seek a long-term sustainable outcome acceptable to all parties. I am concerned that the process the Council has followed to date will not deliver this unless major changes are made to the approach.

Two wrongs don't make a right

9. The issue of the Akaroa wastewater treatment plant has arisen because the Akaroa Council, back in 1963, failed to consult with and listen to the affected community. The plant was placed at Takapūneke on the outskirts of Akaroa, a highly historically and culturally significant place for tangata whenua. They were not consulted and their voices were not heard. It has caused great offence since. It is good that this has now been recognised and that the plant is to be moved to a new location. I commend the Christchurch City Council for dealing with this. Had the affected people been consulted in the first place, the pain of many years could have been avoided as well as this expensive move.

10. Finding a location for a new treatment plant is hard enough, but finding a place to dispose of the wastewater emanating from it is even harder if permanent harbour discharge is ruled out due to further cultural offence. Land based disposal presents more difficulties than harbour disposal – it will be a closed system with the capacity to absorb a limited amount of water, the water can only disperse slowly through the land or risks polluting streams, the land must be acquired and neighbours and communities potentially affected.

11. I see the Council is currently in grave danger of repeating the errors of the past, and choosing the site for a land based disposal system based on technical criteria alone, and putting it in a place that will be offensive and environmentally damaging for many years to come. Two wrongs will not make a right.

Changing the Disposal mentality

12. The principle reason this is happening is that the Council is pursuing a disposal based strategy rather than one focussed on beneficial reuse.

13. To date the Council team working on this project has been principally staffed by wastewater engineers taking advice from geotechnical consultants. While geotechnical information is relevant and useful, particularly on steep, slip-prone Banks Peninsula, the issue is also a social challenge. What has been missing from the team, and needs to be added, are the people with skills to market the water as a resource, skills to understand the values of rural communities, the use of water to increase farm productivity, the ecology of Banks Peninsula and expertise in the development of reuse and recycling systems around the world. The team working to resolve this complex issue needs to be multidisciplinary and to take a more holistic approach that it has to date.

14. The Council needs to engage such a team and then change its approach from the disposal mentality to one of using the water where it can be of the most benefit. The water is a resource, and the Akaroa township is chronically short of water already and set to be in a worse position in the future. The water needs to be reused and recycled in Akaroa and ways to achieve this need to be the goal of the exercise, not dumping it on the nearest geotechnically suitable location.

15. A precursor to achieving this is to treat the water to a standard where it can be safely reused.

16. The process to date has been so rushed and so "disposal" focussed that the inclusion of Option 4 – Non-potable reuse in Akaroa through a purple pipe system is as far as the community has managed to get with beneficial use concepts, but new ideas are emerging.

17. Peninsula communities are intelligent, engaged and with a strong sense of place. There is a desire to do what is right. The Council's team needs to work with the community, possibly following a model like the Working Party, to find the best solution and to market that solution to Akaroa.

Support the Friends of Banks Peninsula submission

18. I support the Friends of Banks Peninsula submission and its solution of Option 4 – Non-potable reuse in Akaroa with an interim harbour outfall connected to the purple pipe network until 100% reuse can be achieved. I do so because it fosters a long term sustainable approach based on the principles of Reduce, Reuse and Recycle, and it is the best option on the table at present.

19. I also support the concept of implementation in stages to minimise the risks involved with land disposal on the steep, slip prone terrain of Banks Peninsula and to learn from actual experience rather than solely theoretical modelling as the system rolls out.

20. The Friends submission is framed within the options presented in the consultation booklet. The emphasis is Reduce and Reuse. Recycling the water is not included in the consultation options, and is only now, post Working Party and during the submission period, that community members are beginning to discuss and consider it. I will discuss this further at the end of this section.

Reduce

21. *Reducing* the wastewater flow is discussed in the Friends submission and the Council commended for its work to reduce infiltration. A public education campaign to further reduce wastage is sought. There is potentially much more scope to explore this aspect of the overall system, and I request that wastewater flow reduction remains a live topic as the chosen solution progresses.

Reuse

22. *Reuse* is the principle thrust of the Friend's submission using Option 4 - voluntary reuse in Akaroa through a purple pipe network to supply water for gardening and other external uses. The existing water usage figures included in the March 2017 Beca report show that 100% reuse in Akaroa through voluntary external use could theoretically be achieved. There is demonstrably more than enough demand now for external water use than the entire wastewater flows and that is within the context of summer water restrictions choking demand.

23. The Friends submission suggests that this Reuse be achieved with a staged approach to reduce risk, spread the costs over a longer period and avoid high upfront investment in oversized capital infrastructure. It recommends roll out of the purple pipe system combined with summer only irrigation in the first stage and deferring the substantial cost of the winter storage ponds until sufficient demand has built up.

24. A time period is not given for this, but if 5 to 7 years was the aim, this would be comparable to the establishment period for full watering of native trees, as a canopy sufficient to preclude much of the winter rain from hitting the ground is required before winter irrigation can take commence.

25. I support the Friends suggestion that demand for the water be encouraged with a demonstration garden to inspire confidence in the water and development of reticulation to deliver it to properties. Methods such as capping the amount of potable water per house or charging for potable water usage have not been suggested, but are potentially available to encourage voluntary take-up, and may be needed if the potable supply comes under further stress in the future.

26. I note that in other places where water reuse and recycling is practised, there multiple uses made of the water. In California this includes domestic purple pipes, irrigation to parks and golf courses, agricultural use, industrial use and ground water recharging. A similar pattern occurs in Florida.

27. The Council still needs to do the work of looking into additional beneficial uses over and above the purple pipe network reticulating to homes in Akaroa. Voluntary beneficial reuse for horticultural or agricultural uses has not been explored. The Council has never tried to market the water or to find if there is commercial interest.

Recycle

28. *Recycling* is another area now be emerging. By recycling I mean ground water recharge of the Akaroa supply, or direct redirection to the potable supply.

29. Ground water recharging of the Akaroa water supply has not yet been explored, but may be possible even in the basalt, as we now understand that in some places it does contain aquifers. Recycling through ground water recharge would potentially provide a way to augment Akaroa's limited potable water supply in a way that met Ngāi Tahu cultural values.

30. Direct return to the potable supply has also been ruled out, and never placed before the public as an option.

31. I submit that the Council has not thoroughly investigated land based solutions until it has further examined these options, and at least as robustly as the options currently on the table. Based on the solutions developed by other places facing water shortages, a combination of these options could well be the solution for Akaroa.

Interim Harbour outfall

32. I support the concept of an interim harbour outfall integrated with the purple pipe network until such time as 100% of the water can be reused.

33. I do not support harbour outfall as a permanent solution because the water is being wasted.

34. As an interim solution harbour outfall combined with the purple pipe system it is relatively cost effective, the highly treated water would be disposed of into the harbour where it will be rapidly diluted and flushed out to sea, and given the high treatment level required for reuse, I do not believe it would have environmental impacts.

35. Setting up of such an interim harbour outfall also provides an emergency long term overflow in case there are times when the water cannot be disposed of to land and storage is full.

Treatment standard

36. All community gatherings discussing the issue have identified the treatment standard as the key to reuse. Hence this was adopted as the first principle in the Community Strategy.
37. The treatment standards may vary depending on what type of beneficial reuse is being carried out.
38. The Friends of Banks Peninsula submission has suggested post treatment disinfection to raise the water quality to that suitable for salad crops would be needed to give the public the confidence they need to water gardens.
39. The Takamatua Ratepayers have suggested reverse osmosis, and this could be used to create potable water for return to the drinking supply with a liquid fertiliser by product.
40. I support both of these ideas and request the Council thoroughly investigate and cost both of these options in conjunction with a reuse and recycling system.

Distinguishing between voluntary beneficial reuse and disposal

41. I support voluntary beneficial reuse of water anywhere, including in Takamatua Valley or Robinsons Bay, provided that water is treated to the salad crop standard proposed for reuse in Akaroa.
42. I encourage the Council to market the water to communities for voluntary reuse.
43. The key to voluntary reuse is that the consumer controls the volume of water applied and when it is applied, and is not required or forced to apply the water when they consider that the conditions are unsuitable or no benefit is derived. I would expect the Council to ensure that any geotechnical matters requiring consideration would be addressed at the consent stage, as irrigation of wastewater would still require a discretionary consent, enabling the Council to set broad standards for its reuse.
44. A **disposal field** means that the water will be irrigated to the maximum level considered geotechnically feasible, whether or not the vegetation growing on it is able to take up that water. **The land will be kept permanently at a near saturation point for decades to come. It may never be able to dry out.**

Objection to land based "disposal" solutions proposed for Robinsons Bay and Takamatua Valleys

45. The proposals for Takamatua and Robinsons Bay listed in the consultation document are for intensive **disposal fields**, not for voluntary use. They do not seek to make beneficial use of the water, but instead to dispose of it in the nearest feasible location.
46. I oppose land based **disposal** anywhere in Robinsons Bay or Takamatua because of the potential impacts on residents and risks to the environment..

47. My concerns include:
    - Experimental and high risk nature of land disposal on Banks Peninsula
    - Increased risk of slips and flooding onto vulnerable valley floors
    - Issues with large storage ponds
    - Inherent risks with being at the end of the pipe
    - Failure of systems elsewhere
    - Lack of Trust in the Council
    - Sunk capital diverting effort from reuse in Akaroa
    - Natural justice.
48. These concerns apply to the Thacker land as well as to the valley floor proposals.

High Risk experiment

49. The system proposed is a world first. Nowhere else is winter storage used in conjunction with land disposal, and nowhere else attempts land disposal to native trees.
50. I appreciate that from a scientific perspective passing treated wastewater through land has beneficial effects in removing pathogens and further filtering the water. However, these natural processes have their limitations, and the land disposal proposed for the Akaroa Wastewater on the terrain of Banks Peninsula is high risk.
51. Natural processes to treat the water cannot operate when the soil is saturated. In that case the water and the other material it carries – nutrients and pathogens – simply make their way downhill to the nearest waterway. When heavy rain occurs, the soils in the irrigated parts of these valleys would be already near saturation point, and their absorption capacity would be extremely limited. Most of the rain will run-off to the nearest stream and along with leaching of the irrigated wastewater.
52. Engineers exude confidence that the parameters they are using to model storage and irrigation rates are correct, but in the course of the Working Party we learnt of several other land disposal systems that have failed or needed to increase their land area because of nitrogen saturation or increases in demand. These systems failed to meet their design criteria.
53. Hence I would expect such a system to be built on high risk Banks Peninsula to be built on robust data and to be approached in a cautious manner one step at a time.
54. Instead I see a design based purely on theoretical modelling and the Council about to commit to and pay at the start for infrastructure sized for projected demand in 25 years time before the concept has been proved.
55. In Robinsons Bay soil samples have only been taken during the course of a single season, and that is following two dry winters. Some of the Robinsons Bay samples were incomplete.
56. The trial watering native trees with Duvauchelle treated wastewater has also only been operating for a year. This does not enable the tree growth and health after a number of years to be assessed, nor the stage at which the canopy would be sufficiently established to enable greater watering levels.

Slips and Flooding

57. In 2007/2008 I researched the incidence of historical flooding in Akaroa and the inner harbour bays as part of the Christchurch City Council Akaroa Harbour Settlement study. The research covered a timeframe from 1934 when rainfall records in Akaroa began until 2007 and was written up in the *Historical Flooding Research and Mapping Project* report.

58. This revealed that every valley in the inner harbour has been affected by flooding at some time, and that both summer cyclones and winter storms have been the cause. The particular place affected varies depending partly on where the most rain has fallen, but also where a blockage, often caused by a slip, has occurred up-stream, leading to water build up and then flash flooding.

59. The state of culverts and their ability to drain to the sea exacerbates flooding.

60. Both Robinsons Bay and Takamatua have experienced flooding after heavy rain, and hence I support the concerns of community members that adding substantial amounts of water to their catchments resulting in land with permanently high soil moisture levels may increase the incidence of slips and flooding.

61. Figure 1 at the end of this submission shows the flooding experienced in Robinsons Bay in 1994 as mapped in the *Historical Flooding Research and Mapping* report.

62. Figure 2 shows the recent flooding around the historic Pavitt cottage in Robinsons Bay experienced after Cyclone Debbie on April 6 and 7, 2017. A total of 192.6mm was measured as the rainfall at Akaroa over those two days. While this was a large amount, the records in the report show that rainfall of a similar or heavier level was recorded on at least 13 occasions since 1934, suggesting that this level of rainfall is at least a 1 in 10 year event based on past weather patterns. Cyclone Debbie was forecast to be as strong as the Wahine storm until it changed course from its predicted path, and a forerunner of the increased ferocity of storms predicted with the warming climate. This single storm led to complete soil saturation, with moisture deficit levels reaching 0. A few days later the area experienced a further 85.4mm of rain over four days between April 12-April 15 and the area behind the historic cottage remained flooded. Again the pattern of a cyclone hitting twice has been experienced before, most savagely in 1936, and may well happen again.

63. The most recent Beca report indicates an elevated risk of localised bank collapse for the streams draining the irrigation field. This type of slipping could block a stream during a major storm causing water build up followed by flooding.

64. Sea level rise is going to challenge the ability of these low lying valleys to drain to the sea. It was fortunate that the culverts in Robinsons Bay had been cleaned out just before Cyclone Debbie hit, after repeated complaints from residents dating back to before Christmas.

65. If the engineering designs prove to be incorrect, or if the impact of climate change is greater than anticipated, then it is the properties in the valley floor downstream from the irrigation field that are most at risk. In Robinsons Bay this includes the historic Pavitt cottage and 5 other homes.

Storage ponds issues

66. Winter is an inherently limiting factor on the steep slopes of Banks Peninsula, the land will be too wet to absorb all the water without increased danger of slips. The water must instead be stored in huge ponds.

67. The ponds present potential problems to visual amenity and with odour and midges. The Press recently informed readers that Aranui suffers ongoing issues from midges that Christchurch City Council is unable to solve, and that these problems are worse now that the water quality in the ponds is higher. The consultation document does not state that the ponds would be covered. I submit that this is essential if odour and midge issues are to be avoided, and to keep the highly treated water safe from fouling by wildlife.

68. **Pond overflow** is a major concern. The consultation document states that if the ponds become full they will spill to the nearest stream. The ponds would become full if a wet summer meant that insufficient irrigation had been possible and the ponds contained a large amount of water at the start of the next winter. The stored water could not be irrigated out until the soil moisture levels had dropped. If this situation did occur and the pond filled up early in the winter, then the entire wastewater flow from Akaroa, potentially for the rest of the winter, would simply overspill to the nearest stream. This is an issue that has been glossed over and needs attention. I support the position taken by Friends of Banks Peninsula that some form of emergency overflow is needed for this situation, and that the harbour or ocean is the only suitable way to deal with this given that it will occur when the land is wet and streams will be in full flow.

69. The current method for mitigating this risk is to build the storage ponds to a much larger capacity than is anticipated for the near future. While this may mitigate the risk to a degree, it is a very expensive method of doing so, and not guaranteed. By way of analogy, a big bathtub make take longer than a small bathtub before it overflows, but if the taps are left on it will still make a big mess when it does if that overflow is not directed to a suitable drain.

Failures elsewhere

70. Since participating in the Working Party and undertaking further research into the impacts of land disposal schemes elsewhere, more concerns have come to light around the failures of many land based schemes to date, and the pollution and problems they have created, particularly with nitrogen saturation.

71. These concerns are exacerbated in valley catchments and magnified when there is downstream infrastructure.

Inherent risks at the end of the pipe

72. There is an inherent risk to being downhill, downwind, or downstream of the wastewater infrastructure.

73. Other sewage treatment schemes often breach their discharge consents or experience other problems. The recent story of the midges in Aranui is an example. Odour due to shock contamination is another, as occurred in Temuka recently. The Purenga stream running through the middle of Rotorua Whakarewarewa system is now one of the most polluted in the country.

74. People seeking to purchase properties and move into new neighbourhoods are wary of risks like this. Valuation work carried out during the development of the *Community Strategy* indicated that devaluation of around $1.8 million was likely to properties in the area if the proposal to irrigate Robinsons Bay and build the main storage pond occurred there. People trying to sell houses while the uncertainty of the wastewater disposal exists have experienced this first hand.

Thin end of the wedge

75. The Takapūneke treatment plant has been in place for nearly 60 years. Akaroa has expanded massively during that time.

76. Wherever a new system goes it will be there for many years. If it needs to expand either because of design failure or growth, new land will be acquired.

77. A great fear of Robinsons Bay is that if a system is developed there, it will be constantly added to as other areas are reticulated increasing the risks to the community.

Lack of trust in Council

78. The process of identifying suitable locations for ponds and irrigation based on geotechnical criteria to date has been so polarising that it has created a great mistrust of the Council. The resultant consultation document with its many ill-defined options has not helped.

79. Working Party members were asked to provide feedback on the draft. I asked for the options in the booklet be more clearly laid out and explained, enabling the public to to gauge the effects and risks of different options and make an informed choice.

80. These suggestions were rejected and the consultation booklet includes maps showing many pond sites and irrigation areas all over the valley floors and up their lower slopes, but without clear implementation solutions.

81. What would actually eventuate, should either Takamatua or Robinsons Bay be selected for disposal is therefore unclear. Would it involve the huge ponds at the waterfronts or close to houses and intruding on their views and amenity? Or is it Pond Site 10? Would it include trees blocking views and causing shading or would it be spray irrigation which is even more unpopular? Would it include forced irrigation onto people's gardens and lifestyle properties? What sort of stigma might attach to the areas if these massive structures and irrigation are introduced?

82. Robinsons Bay residents feel incredibly threatened. Six different storage pond sites are identified in our lovely valley. Several are sited close to people's homes, where they would intrude of views, be incredibly unsightly, have the potential for odour and midges, and a detrimental effect on the entire community. Irrigation, including the reviled spray irrigation, is still proposed for the entire valley floor. The areas identified include even more properties than in the initial maps released in October. The buffer zones are much less than those actually in place at other land disposal systems around New Zealand. (Note that in other places the consented buffers may be similar but the actual location of fields is much further from houses than it would be under the plans shown in the consultation document).

83. Council staff have frequently made mention of compulsory purchase and indicated that it is not usual practice to pay financial compensation paid to affected neighbours.

84. It is hardly surprising under these circumstances that there is great consternation and a severe lack of trust in the Council's intentions.

Sunk Capital in the wrong place

85. Commissioner Collins raised the issue of sunk capital in the wrong location in his decision rejecting the harbour outfall. The same reasoning applies to a disposal field in Robinsons Bay to take residual flows in conjunction with a purple pipe network in Akaroa. The large sunk cost would direct the water, the funding and the effort away from further developing the purple pipe network in Akaroa.

86. As previously stated, planting and growing trees to a stage where they were suitable to act as a disposal field would probably take 5 to 7 years. During this time Takapūneke and its harbour outfall would continue, so establishing a disposal field in Robinsons Bay not only diverts funding from reuse in Akaroa, it is also not a quick solution and both the Takapūneke plant and a harbour outfall would still be needed during this time.

Natural Justice

87. The Robinsons Bay and Takamatua communities do not create the wastewater. The residents of these areas have paid for the capital cost of their own septic tanks and the costs of running them, but they would have to suffer the consequences of being a disposal field for another community.

88. The residents have brainstormed their values and identified that they live in these communities because they value the peace and quiet, clean environment, fresh air, beauty and recreational and food gathering opportunities. They try to live in a sustainable way, with many growing organic food, and they have strong connections with the place, and a lot of local knowledge.

89. The *Community Strategy* identified that Akaroa needs to take responsibility for its own wastewater. Dumping its waste on another community, externalising the risks onto that community, and turning its back on its responsibilities is not a defensible position.

90. Akaroa can deal with its waste water through voluntary reuse.

91. Akaroa can also contribute through an additional rate to pay for the costs. I submit that if the only acceptable solution to all parties turns out to be more costly than the current project budget, and the Council is not prepared to fund the additional cost from the general rate, then a specific rate should be struck for those connected to the Akaroa reticulated wastewater system to meet the costs. Rural residents have often paid as much as $20,000 for their septic tank systems and their rates contribute to the Council's capital projects, so they are already contributing to the capital budget for a system that will bring them no benefit and may do them harm. I do not see why urban dwellers in Akaroa should expect that their problem is solved by dumping on neighbouring rural communities to save costs, rather than reaching into their pockets and paying for a solution that does not detrimentally affect others.

92. Finally there is a great injustice if some landowners can sell their land to the Council, make a profit and exit the community, leaving their neighbours to face the effects without any compensation.

Thacker land presents the same issues

93. The Thacker land in Robinsons Bay presents just such a case – the owner would sell and make money, leaving the risks of slips, flooding, ponds and devaluation to be borne by those left behind.

94. The Thacker land solution was pushed by the Council staff and their consultants as the favoured solution to the Working Party. Concerns of the residents were constantly downplayed, while at the same time it was quite apparent that other options included in the consultation document, such as Pompeys Pillar, lagged behind in their development. Spurious constraints such as the Outstanding Natural Landscape restrictions were later introduced along with landscape assessments claiming that irrigation at Pompeys Pillar would have significant effects.

95. The Working Party Joint Statement reflects that the group had significant concerns with the Thacker land proposal. Because it was further from houses it was seen as a less objectionable option than irrigation to the valley floor in Robinsons Bay, but it was only deemed acceptable with severe restrictions including that it would only be suitable for part of the water and if there was mitigation and tangible benefits to the community.

96. However, a more detailed proposal based on the Thacker land has not been presented as an option by the Council in the consultation or fleshed out in any way. The community is therefore not able to comment on a specific proposal related to this land, including location of the irrigation and ponds, the total volume of water that it would be expected to absorb, or the mitigation and compensation measures that might be included as part of a package.

97. Hence when the concept of supporting the Thacker land was discussed at a community meeting, it was rejected. The risks were considered too high, particularly to the downstream properties such as Pavitt cottage.

98. The lack of confidence and trust in the Council compounded the concerns.

Pompeys Pillar

99. Commissioner Collins suggested that a large remote farm be used for the land irrigation. This is a similar approach used to solve the solid waste problem with land fill at Kate Valley .

100. There is potential for beneficial use on the farm at Pompeys Pillar, provided that the Council comes to an arrangement with the farming family who own the property and are prepared to accept it. However, at this stage it seems unclear whether sending the water to the farm would in fact be beneficial to the farm, or whether it would be another form of disposal requiring compensation to the landowner.

101. I agree with the Friends of Banks Peninsula submission that an interim harbour outfall and a full reduce, reuse, recycle solution based around Akaroa is the optimal way to go, but that Pompeys Pillar does provide an alternative solution if harbour outfall is ruled out.

102. I am concerned that the exclusion of the Outstanding Natural Landscape zoned land potentially pushes the irrigation area closer to the only neighbouring house to the Pompeys Pillar farm. I suggest that applying the Outstanding Natural Landscape

zoning to this irrigation project is largely irrelevant and that of far greater importance is to create a larger buffer zone between irrigation and the neighbouring house, if Pompeys Pillar farm is to be used as a disposal field.

Proposed staged solution

103. I support the staged solution proposed by the Friends of Banks Peninsula. This will enable the Council to:

- minimise the risks,
- defer substantial costs until there is proof of concept around reuse,
- close the Takapūneke plant rapidly,
- wean off harbour outfall over time, and
- retain a safe overflow mechanism for emergency use if needed in the future.

104. The broad stages could be:

STAGE 1 Council pulls together a multi-disciplinary team and investigates how to implement a purple pipe system, and other options for the longer term reuse and recycling. These are planned, costed and included the Long Term Plan currently under development. A resource consent is applied for once this plan is defined.

STAGE 2 Council builds the new treatment plant, with water treated to a standard that it can be safely reused in gardens for watering including salad crops and installs the first part of the purple pipe network in Akaroa. It retains a harbour outfall connected to and as an integral part of purple pipe network. The Takapūneke plant is turned off and removed once the new plant is operating. No winter ponds are built at this stage. The aim is only to reuse the summer water and the winter flows would still go to the harbour.

STAGE 3 Once all summer water is being used, then demand for winter water is assessed and developed. Winter storage ponds are added to the system on an as needed basis. This could involve building several smaller ponds or creating storage in large tanks distributed to different locations. Although the capital cost may be higher for multiple ponds than a single large pond, this method allows for costs to be deferred and storage to be built on an as needed basis, rather than an early overcapitalisation.

What this asks of Ngai Tahu

105. I acknowledge that for many generations the Ngāi Tahu people were subject to compulsory acquisition of their land and suffered many disastrous affects as their culture was supressed and their views devalued – the placement of the treatment plant at Takapūneke being one, the discharge of treated wastewater to the harbour another.

106. I recognise that my submission asks for that harbour discharge to continue for some years into the future as the **interim** measure during transition to full reuse and

recycling and that it is asking Ngāi Tahuand manawhenua to be patient and pragmatic while the best possible solution for Akaroa, full reuse of the water, is developed.

107. That wastewater from the Wigram Skies development outflows to the Christchurch ocean outfall gives me hope that pragmatic considerations can be taken into account alongside the cultural values.

108. If interim harbour outfall in Akaroa is tied to the purple pipe system, as recommended in the Friends of Banks Peninsula submission, then the water flowing to the harbour will be treated to the standard suitable for watering gardens in Akaroa. This will be an improvement on the current Takapūneke plant, so gains will have been made with this system even at the start.

109. I also ask Ngāi Tahu and manawhenua to be understanding and considerate of the concerns of residents of the valley communities, currently feeling very threatened by land disposal. It is clear that we share the view that having a land disposal field near a community creates a risk. The May 2016 Beca state on page 45 - *Land areas to the south of Akaroa were investigated in an earlier study by Harrison Grierson in 2010 and ruled out in conjunction with the Ngāi Tahu parties and the Akaroa Working Party due to the proximity of this land to Ōnuku Marae*

110. I was shocked that during finalisation of the Working Party joint statement the Ngāi Tahu parties chose to distance themselves from the general agreement that compulsory purchase should not be used and that financial compensation should be paid to parties ill affected by a land disposal system. A core principal for me in trying to solve the Akaroa community's problem and accommodate the cultural values of Ngai Tahu, is that the costs and risks should not be externalised onto third parties – in this case the residents of rural areas of Banks Peninsula. If in the end such affects were to occur, I would hope that these third parties would be treated with the utmost respect and fully compensated for their sacrifice and loss.

111. I ask that the Ngāi Tahu parties recognise that these communities have supported Ngāi Tahu cultural values in their *Community Strategy* and have been trying hard to find a solution that not only moves the plant from Takapūneke but also works to bring an end to harbour discharge in the long run.

Conclusion

112. I submit that the Council needs to revamp its team and their approach and replace the search for a disposal based solution to one of 100% beneficial reuse.

113. I support Option 4 – Non-potable reuse in Akaroa, with a harbour outfall as the interim measure until the 100% beneficial reuse has been achieved. I submit that the water must be treated to a standard that gives people sufficient confidence that they will uptake it for use in their gardens, and that as such, it will not have an environmental impact on the harbour. I acknowledge the cultural offense will remain for some time.

114. Option 4 only emerged recently as a result of the Working Party and I submit that it needs to now be fully researched and developed, including how it could be staged in.

While 100% reuse in Akaroa through a purple pipe network appears theoretically possible, I suggest that the Council also needs to investigate other options: these include other beneficial uses in the area and the concept of water recycling, either directly to the potable supply or through ground water recharge system. Reductions in infiltration and wasteful use must also be part of the solution.

115. The solution must look to the future , where the environment is predicted to be drier, stormier, with higher sea levels and an increased demand for water.

116. I suggest the Council report back to the Environment Court that it has made progress, but has not yet completed its investigations and will now work more closely with the community to develop and refine reuse and recycling solutions. It should commit to develop a staged approach to 100% land based reuse include the implementation stages and costings as goals in its Long Term Plan. The approach should move one step at a time, be based on actual experience rather than purely theoretical modelling and introduce expensive infrastructure as and when it is needed. The winter storage ponds should be deferred until a system based on summer flows has been installed first and demonstrated to work.

117. I wish to be heard in support of my submission.

Figure 1 Robinsons Bay flooding pattern 1994. Extracted from Akaroa Harbour Settlement Study Areas Historical Flooding Research and Mapping Project report 2008.Orange areas show flooding experienced.

Figure 19 July 1994 Robinsons Bay

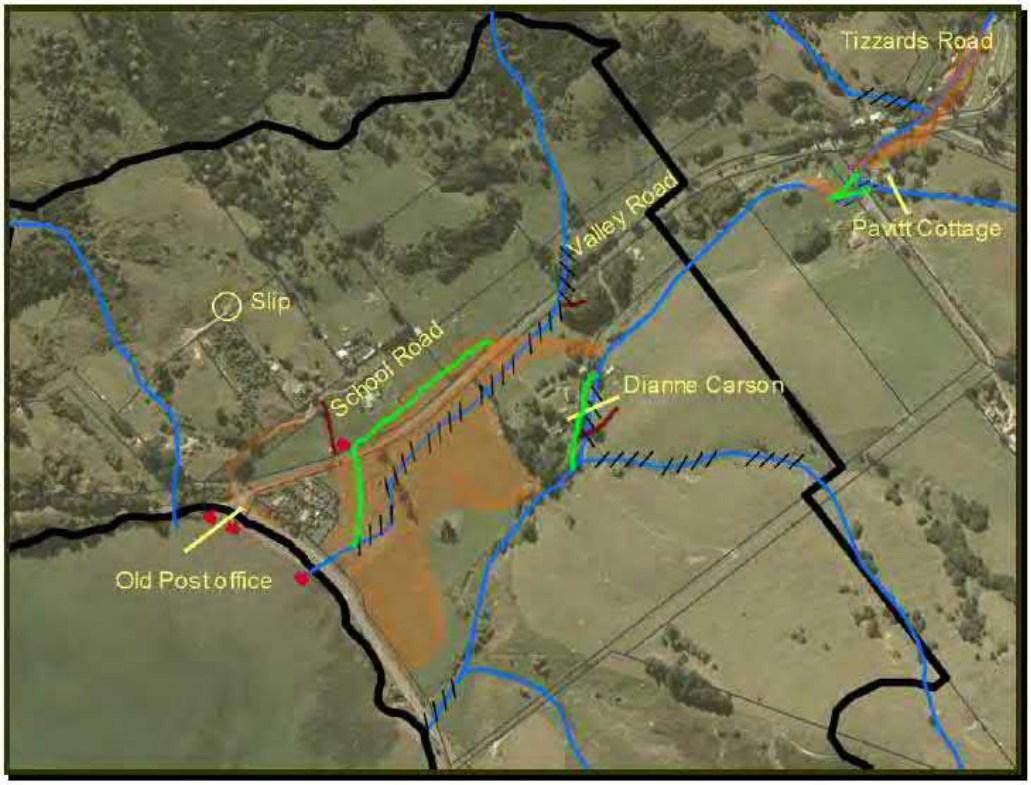


Figure 20 Photographs Robinsons Bay July 1994

Robinsons Valley Stream behind Dianne Carson's house during 1994 floods. Stream has overflowed normal banks, and broken out here, but returned to its bed by the time this picture was taken.

Supplied by Sue Church, Dianne Carson's daughter

Figure 2 Flooding at Pavitt cottage April 2017

As the site of the first powered sawmill on Banks Peninsula, Pavitt cottage is of great historical importance to Canterbury. Its historical significance has been long recognised locally, with the site registered by the Historic Places Trust and documented in the book "The Old Water Wheel", by Jessie Mould. The cottage was purchased by Pavitt descendant John Fernyhough, fully restored and left in trust for use by the extended family in 2002. It has since been used for community events as well as family occupancy and is seen as the hub of the community. It is greatly valued by Robinsons Bay residents. More information is on www.pavitt.co.nz.

The areas shown flooded behind the cottage were formerly part of the mill workings. The former mill site sits at a confluence of streams in Robinsons Bay and is likely to be at elevated risk of flooding if soil moisture levels in the Thacker land above are maintained at a high level due to a wastewater irrigation disposal field or from steam bank slips.

View from behind the cottage on the Thacker land showing runoff experienced in Cyclone Debbie. Before Cyclone Debbie the land had a soil moisture deficit. The rainfall experienced (based on Akaroa data) was 192.6mm. This level of rainfall has been experienced at least 13 times since 1934, so this could probably be classed as approximately a 1 in 10 year event based on the previous climate. It is likely to occur more frequently and heavily with the increased cyclones expected under climate modelling.

Submission No: 1007

CHRISTCHURCH CITY COUNCIL
Akaroa Wastewater Scheme

- Received via Have Your Say -

Submissions close 5pm, 30 April 2017

Full Name*:	Brent Martin
Contact Address*:	
Postcode:	
Telephone number:	
Email Address:	
Date Sent:	4/30/2017 10:34:45 AM
Would you like to attend the hearings for this consultation?	Yes
I am completing this submission:	For myself
Role within Organisation	
Group/Organisation Names	
How many people do you represent?	
Preferred environment for Akaroa wastewater discharge:	Other
If Other, please describe and state reasons	Beneficial re-use in Akaroa with transitional harbour outfall. Please see attached submission.
Option 1	Option 4 - Non-potable reuse in Akaroa, in combination with another option
Option 2	Option 2 - Irrigation of trees or pasture at Pompeys Pillar
Option 3	Option 5 - Disposal via a new outfall pipeline to the mid-harbour
Option 4	Please select
Option 5	Please select
Option 6	Please select
Other	I support re-use in Akaroa in combination with a transitional harbour outfall. Please see my attached submission
State reasons for ranking	Please see my attached submission.
Would you be more supportive of spray irrigation of treated wastewater to pasture? Why	Depends on the location. Spray irrigation would be appropriate at Pompeys Pillar for farming purposes but not in occupied valleys such as Robinsons Bay or Takamatua, where tree irrigation would be preferable (at a suitable distance from any residences to avoid adverse amenity impacts).

Do you have location preference? Why:	Pond site 10 is in the best location to augment re-use in Akaroa.
Should Council add aspirational projects to the Akaroa wastewater scheme?	I support the inclusion of fire ponds where appropriate.
Any other comments?	Please see my attached submission.

Akaroa Reclaimed Water Beneficial Reuse, Treatment and Disposal Options

Personal submission by Brent Martin

I support the Friends of Banks Peninsula submission, and agree with its central arguments:

I. The approach taken until very recently has been to look for ways to dispose of the wastewater to land rather than re-use it where it is needed.

II. Beneficial re-use of all of the reclaimed wastewater in Akaroa has been shown to be feasible

III. Akaroa suffers from water shortages over summer, so there is a need to be met

IV. Land disposal on Banks Peninsula carries a high risk, requires a large capital outlay, delays the closure of Takapūneke and does not enable beneficial re-use in Akaroa

V. A purple pipe network for external use (chiefly garden watering) has the potential to absorb all of the reclaimed wastewater

VI. Focussing on beneficial re-use in Akaroa may identify other ways to use the reclaimed wastewater

VII. Combining beneficial re-use in Akaroa with a transitional harbour outfall is a cost-effective, pragmatic approach that minimises risk and allows time to develop the most beneficial outcome.

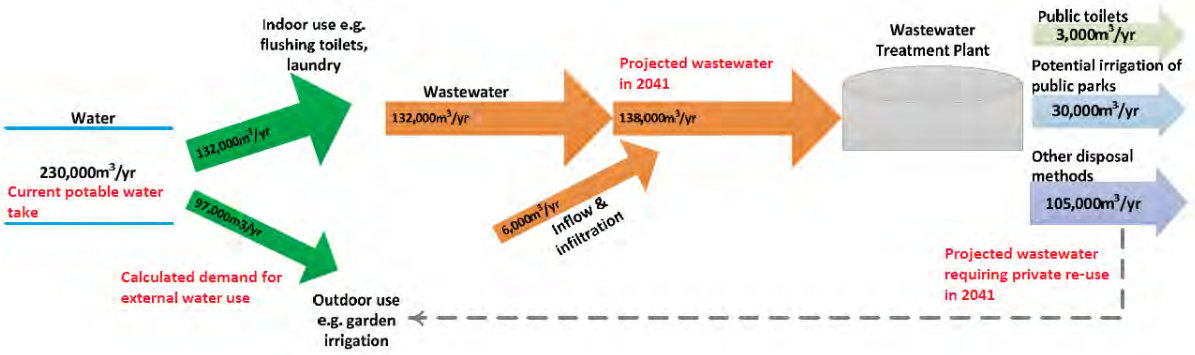
A disposal approach has been taken

1. When Ecan declined the application for harbour discharge, the commissioners argued that alternatives had not been reasonably explored, because Council staff had only considered disposal to small areas of land. They had not, for example, considered irrigating a larger farm at a much lower rate. This same approach persists, with all land irrigation options being assessed through the lens of irrigation at the highest rate to the smallest area of land possible. This is disposal, and it maximises any risks from excesses of water or nutrients.

2. The potential for re-use via a “purple pipe” system was briefly considered, but the only options considered was re-use for toilet flushing, which carries a very high per-connection cost and uses only a small quantity of the reclaimed wastewater. Other uses, such as garden watering, do not appear to have been considered.

Beneficial re-use of all of the reclaimed wastewater in Akaroa has been shown to be feasible

3. The latest Beca report includes an assessment of the potential demand for externally used water (chiefly garden watering). The key diagram is reproduced below, with my annotations in red:



4. The diagram shows that the calculated demand for externally used water (97,000m^3/yr) is *almost* enough to meet the projected wastewater flow requiring re-use after removing municipal use (105,00m^3/yr). However, we understand from discussions with Council staff at the Working Party meeting that this calculation mixes *current* water usage with *future* wastewater flows. Using only current figures, the maximum wastewater flow for the past five years has been approximately 100,000m^3/yr. Using this figure to recalculate the external water demand and projected wastewater flows requiring private re-use, there is *more than* enough demand for external water use (136,000m^3/yr) to meet the wastewater supply of 67,000m^3/yr. Further, Council has recently carried out improvements to the network that have reduced infiltration; in the past two years annual flows have not exceeded 80,000m^3/yr.

5. The current external water use is constrained by watering restrictions; the *unconstrained demand* could be significantly higher.

3. Akaroa suffers from water shortages over summer, so there is a need to be met

6. As recently reported in the Press, Akaroa's water usage soars over summer, peaking at around four times the winter flow rate.

7. Watering restrictions are in place in Akaroa for up to five months over summer.

8. The Akaroa streams run as low as 4l/s in summer, when demand is highest. Low flows impact aquatic life, including by raising the water temperature.

Land disposal on Banks Peninsula carries a high risk, requires a large capital outlay, delays the closure of Takapūneke and does not enable beneficial re-use in Akaroa

9. Wastewater disposal to land is challenging on Banks Peninsula because of the topology and soil type. This introduces significant risk, including the potential for slips. Harrison and Grierson identified the risk already caused by the Peninsula's high annual variability in rainfall and noted that the proposed loadings are comparable to a doubling of rainfall. This in itself raises the risk of slope instability beyond what has ever been experienced before; add in a run of wet summers and there is potential for field failure, and flooding caused by collapsed river banks (the latter is identified by Beca as a risk in Robinsons Bay).

10. Climate modelling predicts Canterbury's climate will become drier overall, but with a more even spread of rainfall summer and winter, and a greater frequency and severity of intense rainfall events.

a. A significant cost and impact of the land-based disposal is storage ponds. BECA acknowledge that the actual storage required is preliminary only, and that getting the storage amount right is crucial to avoiding spilling the wastewater into local waterways.

b. A land disposal system is a "closed" system that relies on the ponds being sufficiently sized to store all winter flows. However, Banks Peninsula's annual rainfall is highly variable, making this a challenging exercise. If the storage proves insufficient during particularly wet years or because of a series of wet summers, the pond(s) will overflow to the nearest streams. Depending on the final treatment standard this may compromise the fresh water quality of the stream with impacts on aquatic life such as whitebait, and causing nutrients to accumulate in the silty bottom of the shallow harbour bays at Takamatua and Robinsons Bay.

c. Any overflow of the ponds is more likely to occur during heavy rainfall, adding significant additional water volume to streams already swollen by rainfall, and adding to flooding risk.

d. Sizing the ponds sufficiently to try to mitigate this risk increases the up-front capital cost of the system.

11. There is a high up-front capital cost, with no guarantee there won't be additional costs: in several land-based disposal systems (including Whakarewarewa, Ashburton, Rakaia and Leeston) the system has required further capital injection because it either failed to meet its original design performance (with a resultant inability to meet consent conditions) or it was outgrown by the population it serves.

12. A 100% land-based disposal solution is an all-at-once approach, which means there is little ability to spread the high cost.

13. Irrigation to land costs money to run, with Beca's calculations indicating even pasture-based irrigation on the peninsula (which potentially earns an income) still results in a net cost (i.e. earnings from baleage sold do not cover running costs).

14. Land disposal comes with a high opportunity cost. With the exception of Pompeys Pillar, the land currently identified as potentially suitable for irrigation is, at best, high-value land that could be put to better purpose for residences or horticulture and, at worst, is *already utilised for residences or horticulture.* This is a very high cost to pay for minimal benefit.

15. The most recent resource consent for discharge to Akaroa Harbour imposed the following conditions: (1) a new WWTP be constructed and (2) discharge to the harbour from the existing outfall cease by the time the consent expires. Land-based disposal based on tree irrigation will not be able to take all of the wastewater until the planted trees have established a dense canopy (5-7 years). During this time the Takapūneke plant would be required to remain operational to take the balance of the wastewater flow, and the expensive new treatment plant would be partly idle.

16. The establishment of a land-based disposal solution does not aid the beneficial re-use of reclaimed wastewater in Akaroa for two reasons:

    a. It involves a high sunk cost, which dis-incentivises spending on the water re-use reticulation network.

b. A tree-based land disposal field would still be being established at the time it was needed most, and would only be able to take up all of the remaining wastewater once the need had ideally passed because the re-use network was meeting most or all of the supply. It therefore works *against* the needs of a re-use network.

A purple pipe network for external use (chiefly garden watering) has the potential to absorb all of the reclaimed wastewater

17. Although the Beca report includes a diagram that illustrates the potential for external watering to re-use all of the reclaimed wastewater, it does not include any analysis of private re-use.

18. The original rough costing of $10m for a purple pipe network (for toilet flushing) was presumably based on plumbing a connection to every *house*, and assuming this would require streets to be dug up. It was considered to be ineffectual because it was expensive and only used a small proportion of the water. In contrast, using the reclaimed wastewater for external uses such as garden watering could absorb all of the wastewater and is therefore potentially a *standalone* solution.

19. A purple pipe network for garden watering could be considerably less expensive than one for toilet flushing because:

    a. The connection only needs to go to the edge of the property. Also, adjacent properties could share the same connection by "teeing" the end point, requiring only half the number of connections.

    b. The network could be rolled out over time when other underground work is being carried out, reducing the overall cost and spreading it over many years.

    c. The above calculations on re-use potential suggest that, initially at least, only around *half* of Akaroa might need to be reticulated with reclaimed water to absorb all of the annual flow. Combine this with sharing connections between adjacent properties and only one quarter of the connections are needed, which would significantly lower the cost.

20. Using reclaimed water for municipal and private watering is common overseas, particularly in areas where water is in short supply such as California and Florida.

Focusing on beneficial re-use in Akaroa may identify other ways to use the reclaimed wastewater

21. A significant quantity of the remaining reclaimed wastewater might be used voluntarily by local farmers or horticulturalists.

22. Reverse Osmosis has the potential to enable the reclaimed wastewater to be treated to a level that allows further re-use options such as direct recharging of the drinking water reservoir. The remaining waste stream would be dramatically reduced in volume, making disposal easier. Direct potable re-use has the advantage of a year-round demand, so there would be much less need for winter storage (if any).

23. Groundwater recharge has not been explored

Combining beneficial re-use in Akaroa with a transitional harbour outfall is a cost-effective, pragmatic approach that minimises risk and allows time to develop the most beneficial outcome

24. The upgrading of Akaroa's wastewater treatment is a very expensive project, working out at approx. $30,000 per connection. This high cost is significantly driven by the decision to relocate the plant up the hill above North Akaroa, which also increases running costs. At such a high cost it is prudent to try to maximise the benefits gained from the upgrade.

25. The transitional harbour outfall would make use of the main "purple pipe" along the waterfront to convey the wastewater to the South Akaroa. This reduces the length of the underwater pipe to less than half that originally proposed. Since the underwater pipe is estimated (by Beca) to cost approximately four times an overland one, this brings a substantial cost saving.

26. Beneficial reuse with transitional/emergency harbour outfall is a pragmatic, cost-effective solution because it:

    a. Extracts benefit by addressing a genuine need (Akaroa water shortages), and having an immediate impact by removing the water used for public toilet flushing, and greening Akaroa's public spaces.

    b. Achieves the requirements of relocating from Takapuneke and ceasing the current near-harbour outfall.

    c. Sinks the most capital into reusing the water and the least cost into disposal of surplus water.

    d. Reduces the up-front cost and allows the total cost to be spread over a longer period.

    e. Leaves the way open for other beneficial uses of the reclaimed wastewater to be included

To conclude, the Council plans to upgrade Akaroa's wastewater treatment plant such that it will have the potential to produce high quality reclaimed water. It makes sense to make the best use of this capital outlay by re-using the reclaimed wastewater in Akaroa to alleviate water shortages. A combination of re-use with transitional/emergency harbour outfall is a low-risk way to achieve this outcome.

Submission No: 1009

CHRISTCHURCH CITY COUNCIL
Akaroa Wastewater Scheme

- Received via Have Your Say -

Submissions close 5pm, 30 April 2017

Full Name*:	Raywyn Stronach
Contact Address*:	
Postcode:	
Telephone number:	
Email Address:	
Date Sent:	4/30/2017 12:01:54 PM
Would you like to attend the hearings for this consultation?	No
I am completing this submission:	For myself
Role within Organisation	
Group/Organisation Names	
How many people do you represent?	
Preferred environment for Akaroa wastewater discharge:	Other
If Other, please describe and state reasons	I am in favour of option 4 I cannot see any benifit and have lots of concerns if the council decide to put ponds and irrigate in the bay NZ needs to keep its environment as pristine as possible I also fear what would happen in times of flooding and earthquakes
Option 1	Option 4 - Non-potable reuse in Akaroa, in combination with another option
Option 2	Option 5 - Disposal via a new outfall pipeline to the mid-harbour
Option 3	Option 1 - Irrigation of trees or pasture in Robinsons Bay
Option 4	Please select
Option 5	Please select
Option 6	Please select
Other	
State reasons for ranking	
Would you be more supportive of spray irrigation of treated wastewater to pasture? Why	Don’t support

Do you have location preference? Why:	Old coach road which gives more options for treating it
Should Council add aspirational projects to the Akaroa wastewater scheme?	
Any other comments?	

Submission No: 1010

CHRISTCHURCH CITY COUNCIL
Akaroa Wastewater Scheme

- Received via Have Your Say -

Submissions close 5pm, 30 April 2017

Full Name*:	Stephen Eves
Contact Address*:	
Postcode:	
Telephone number:	
Email Address:	
Date Sent:	4/30/2017 1:33:12 PM
Would you like to attend the hearings for this consultation?	No
I am completing this submission:	For myself
Role within Organisation	
Group/Organisation Names	
How many people do you represent?	
Preferred environment for Akaroa wastewater discharge:	Other
If Other, please describe and state reasons	Optiion 4. Reuse of water and not compromising Takamatua nor Robinsons Bay. Discharge away from Inner Akaroa Harbour Water shortages over Summer in Akaroa. Not damaging Takamatua or Robinsons Bay. Not compromising inner harbour.
Option 1	Option 4 - Non-potable reuse in Akaroa, in combination with another option
Option 2	Please select
Option 3	Please select
Option 4	Other (please describe)
Option 5	Please select
Option 6	Please select
Other	
State reasons for ranking	Water shortages over Summer in Akaroa. Not damaging Takamatua or Robinsons Bay. Not compromising inner harbour.

Would you be more supportive of spray irrigation of treated wastewater to pasture? Why	N/A
Do you have location preference? Why:	Reuse
Should Council add aspirational projects to the Akaroa wastewater scheme?	Fire storage
Any other comments?	

Submission No: 1011

CHRISTCHURCH CITY COUNCIL
Akaroa Wastewater Scheme

- Received via Have Your Say -

Submissions close 5pm, 30 April 2017

Full Name*:	Vicki Eves
Contact Address*:	
Postcode:	
Telephone number:	
Email Address:	v
Date Sent:	4/30/2017 1:36:44 PM
Would you like to attend the hearings for this consultation?	No
I am completing this submission:	For myself
Role within Organisation	
Group/Organisation Names	
How many people do you represent?	
Preferred environment for Akaroa wastewater discharge:	Other
If Other, please describe and state reasons	Reuse Water shortages over Summer in Akaroa. Not damaging Takamatua or Robinsons Bay. Not compromising inner harbour.
Option 1	Option 4 - Non-potable reuse in Akaroa, in combination with another option
Option 2	Please select
Option 3	Please select
Option 4	Please select
Option 5	Please select
Option 6	Please select
Other	
State reasons for ranking	Water shortages over Summer in Akaroa. Not damaging Takamatua or Robinsons Bay. Not compromising inner harbour.
Would you be more supportive of spray irrigation of treated	No

wastewater to pasture? Why	
Do you have location preference? Why:	N/A reuse
Should Council add aspirational projects to the Akaroa wastewater scheme?	Fire storage
Any other comments?	

Submission No: 1012

CHRISTCHURCH CITY COUNCIL
Akaroa Wastewater Scheme

- Received via Have Your Say -

Submissions close 5pm, 30 April 2017

Full Name*:	Eves Thomas
Contact Address*:	
Postcode:	
Telephone number:	
Email Address:	
Date Sent:	4/30/2017 1:43:40 PM
Would you like to attend the hearings for this consultation?	No
I am completing this submission:	For myself
Role within Organisation	
Group/Organisation Names	
How many people do you represent?	
Preferred environment for Akaroa wastewater discharge:	Other
If Other, please describe and state reasons	Reuse Water shortages over Summer in Akaroa. Not damaging Takamatua or Robinsons Bay. Not compromising inner harbour.
Option 1	Option 4 - Non-potable reuse in Akaroa, in combination with another option
Option 2	Please select
Option 3	Please select
Option 4	Please select
Option 5	Please select
Option 6	Please select
Other	
State reasons for ranking	Water shortages over Summer in Akaroa. Not damaging Takamatua or Robinsons Bay. Not compromising inner harbour.
Would you be more supportive of spray irrigation of treated	None, reuse

wastewater to pasture? Why	
Do you have location preference? Why:	Not in Robinsons Bay or Takamatua
Should Council add aspirational projects to the Akaroa wastewater scheme?	Fire Storage
Any other comments?	

Submission No: 1013

CHRISTCHURCH CITY COUNCIL
Akaroa Wastewater Scheme

- Received via Have Your Say -

Submissions close 5pm, 30 April 2017

Full Name*:	Sue Church
Contact Address*:	
Postcode:	
Telephone number:	
Email Address:	
Date Sent:	4/30/2017 2:04:24 PM
Would you like to attend the hearings for this consultation?	Yes
I am completing this submission:	On behalf of a group or organisation
Role within Organisation	Secretary
Group/Organisation Names	Friends of Banks Peninsula
How many people do you represent?	247 endorsements on submission
Preferred environment for Akaroa wastewater discharge:	Other
If Other, please describe and state reasons	We prefer beneficial reuse of the water in Akaroa See submission
Option 1	Option 4 - Non-potable reuse in Akaroa, in combination with another option
Option 2	Other (please describe)
Option 3	Other (please describe)
Option 4	Please select
Option 5	Please select
Option 6	Please select
Other	Please see submission for options we seek in combination with Option 4
State reasons for ranking	Please see submission
Would you be more supportive of spray irrigation of treated wastewater to pasture? Why	Location dependent

Do you have location preference? Why:	Pond site 10, covered to avoid odour and midges given proximity to residences and to avoid fouling before reuse in Akaroa
Should Council add aspirational projects to the Akaroa wastewater scheme?	We support aspirational projects. Please see our submission
Any other comments?	This submission has been in the public domain since April 13 and received 247 endorsements.

Akaroa Reclaimed Water Beneficial Reuse, Treatment and Disposal Options

FRIENDS of Banks Peninsula

WE WISH TO BE HEARD
IN SUPPORT OF OUR SUBMISSION

Submission from:
FRIENDS of Banks Peninsula Inc.

Submission version V3-4 April 30 2017 Submitted

Fundamentally, what environment would you prefer Akaroa wastewater is discharged into?

- [ ] Irrigation of reclaimed water to trees or pasture
- [ ] Disposal via a new outfall pipeline to the mid-harbour
- [x] Other (please describe)

Please state your reasons why: We prefer beneficial re-use of the water in Akaroa

Please rate the options listed below with a number according to your preference, with 1 being your most preferred option and 5 your least preferred option (please note the options below are in no particular order).

- [ ] Option 1 – Irrigation of trees or pasture in Robinsons Bay
- [ ] Option 2 – Irrigation of trees or pasture at Pompeys Pillar
- [ ] Option 3 – Irrigation of trees or pasture in Takamātua Valley, in combination with another area
- [1] Option 4 – Non-potable reuse in Akaroa, in combination with another option
- [ ] Option 5 – Disposal via a new outfall pipeline to the mid-harbour
- [ ] Other (please describe)

Please state your reasons for this ranking: Please see our submission for the options we seek in combination with Option 4

Would you be more supportive of spray irrigation of treated wastewater to pasture or drip irrigation to trees? Please state your reasons why:

See submission. This is dependent on the location.

Do you have a preference for the location of reclaimed water storage pond(s)? Please state your reasons why:

Pond site 10, covered to avoid odour and midges given proximity to residences and to avoid fouling before re-use in Akaroa.

Do you think the Council should add aspirational projects to the Akaroa wastewater scheme (e.g. fire storage ponds, providing a reticulated wastewater scheme in Takamātua Valley)? If so, which ones do you support and why?

We support aspirational projects. Please see our submission.

Do you have any other comments? (Please use additional paper if required):

Please see our submission.

Executive Summary

Water is a precious resource. Water restrictions are in force every summer in Akaroa. Its stream fed supply is under such stress that since 2014 the town has had to draw on the neighbouring Takamatua catchment to meet its water demand.

CCC has a problem it needs to address: disposal of Akaroa's wastewater.

What if solving this problem could reduce Akaroa's water shortage issue at the same time?

Data supplied by the Council shows there is more *demand* in Akaroa for external water use (garden watering) than all the wastewater it currently *generates*. With appropriate treatment this wastewater can be efficiently transformed to an almost drinkable standard, turning it from a problematic waste back into a valuable and much needed resource. The key to public acceptance is the highest standard of treatment. People must be convinced that the reclaimed water is 100% safe.

Akaroa's water shortage issues are only predicted to get worse. By taking a sensible step now, the Council can solve two problems at once - bring to an end the disposal of wastewater into the harbour and increase Akaroa's resilience by conserving its potable water supply.

Friends of Banks Peninsula Inc. was established in 1990 to protect and enhance the environmental heritage of Banks Peninsula and safe-guard the environment for future generations. The society has been involved with the Akaroa Wastewater issue over many years and participated in the Akaroa Area Water Services Working Party in 2008 and the recent Akaroa Treated Wastewater Reuse Options Working Party.

This second Working Party was established by the Banks Peninsula Community Board in response to the ***"Community Strategy toward an Acceptable Solution to the disposal of Akaroa Wastewater"*** presented to it by Friends of Banks Peninsula on January 30, 2017. We commend the Community Board for setting up this Working Party and for its choice of Penny Carnaby as the Chair. We believe that as a result of the Working Party deliberations, solutions potentially acceptable to the community have emerged.

The consultation booklet released by the Council offers options sweeping in their breadth and potential impacts, but limited on the detail of how they would be implemented. The plethora of potential sites for storage and disposal is confusing. This submission presents an environmentally sustainable solution based on combining the options to maximise the benefits, minimise the risks, decommission the existing treatment plant at Takapūneke as soon as possible and providing the most resilient for the long term.

1. **The best solution is one that reclaims and beneficially re-uses the water, rather than wastes it.**
    - Under a *beneficial re-use* system the water is taken up by the receiving environment (be it a farm, garden watering) as it is best needed. The water is treated as a resource.
    - Under a *disposal* system the water is distributed to the receiving environment to get rid of it, whether the environment needs it or not. The water is being dumped as unwanted waste.
    - Beneficial use is maximised when the water is *used where it is needed most*.

2. **This submission presents two environmentally sustainable solutions that maximise benefits and minimise risks by combining options from the consultation document, and identifies those solutions that do not meet this aim.**
    - We signal to the Council that Friends of Banks Peninsula is likely to participate in the submission process to any future consent, and we hope this will be in support of a great solution.

3. **Friends of Banks Peninsula strongly supports Option 4 – Non-potable re-use in Akaroa. This forms the basis of the best solution.**

   - Re-use in Akaroa puts the water where it is of most benefit to the environment and people
   - Re-use would be on a **voluntary basis**, with people taking the water because they needed and wanted it.
   - The water must be treated to the highest standard, safe for watering vegetables including salad crops.
   - By taking a lead with re-use in the public toilets and irrigating parks, the Council will demonstrate its confidence in the safety of the water, and it will serve as an incentive for the Council to maintain treatment levels at the highest standards. We recommend a public exemplar garden is developed.
   - The Council's lead will encourage other voluntary uses of the water.

4. **Option 4 signals Council's intention to add a reticulated purple pipe (reclaimed water pipe) system through the town enabling more households and businesses to use it over time.**

   - We would expect this commitment to be reflected in the Council's Long Term Plan process prior to lodging its resource consent.
   - Data in the latest Beca report indicates that *100% of current wastewater flow* could be re-used in Akaroa on external uses (such as garden watering).
   - We recognise that it will take time to reticulate the whole town with a purple pipe system enabling non-potable re-use in Akaroa to absorb 100% of the water, so another method will be needed during the years of transition. Public education to discourage wasteful use of potable water use will assist with this.
   - We recommend full nitrogen removal, ultrafiltration and disinfection (e.g. chlorination) is adopted to produce water of a suitable quality for re-use without causing long-term environmental effects or limiting its suitability for re-use.
   - We signal the need for a back-up should a wet summer reduce the demand from Akaroa to the point that it doesn't use all of the supply.

5. **Option 4 must be combined with another option to take all the water. We present two solutions for the remaining water during the transitional period:**

   Transitional outfall to Akaroa harbour

   - A transitional harbour outfall frees up the most capital for investment in the Akaroa purple pipe system. Operational costs are also lowest.
   - We present two alternatives for implementing a transitional harbour outfall. Both piggyback onto the purple pipe re-use infrastructure to minimise additional costs. They are:
     - New mid-harbour outfall
     - Use the existing Takapūneke outfall
   - Both enable the Council to redirect budget toward installing more of the reticulated purple-pipe network, setting the Council on a path to achieve 100% re-use in the shortest timeframe

- Both enable the Takapūneke wastewater *plant* to be decommissioned as soon as the new plant is operational, but the less expensive of these alternatives retains its *outfall* pipe.
- Disadvantages of a transitional harbour outfall are that the water disposed of to the harbour during the transitional period is being wasted and Ngāi Tahu are being asked to wait longer before disposal to the harbour ends.

Agricultural use at Pompeys Pillar

- Support for this option is predicated on the landowners reaching an agreement with Council that is satisfactory to them.
- Managed as part of the farm, all the water will be put to a beneficial purpose from the outset, however the capital cost is higher than harbour outfall, so less funding may be available for re-use in Akaroa where the environmental and community benefit is greater.
- We recommend that all land identified as geo-technically suitable at Pompeys Pillar is included in the irrigation areas regardless of whether it is overlaid with the Outstanding Natural Landscape zone. This increases the opportunity for beneficial re-use by giving the farm greater flexibility, lowers the risk of the irrigation area failing to absorb the hydraulic and nutrient loads and, we suggest, will actually be *less* visually intrusive.
- Pumping the water over the hill means higher operating costs. The trade-off is that this option is the most rapid land-based system to set-up, and the potential to include high-altitude fire ponds may be another benefit.
- The Takapūneke plant and harbour outfall would both cease as soon as Pompeys Pillar is operational.

6. We do not support the remaining options in the consultation document for the following reasons:

- *Disposal to Takamatua does not make beneficial use of the water*. It is impractical because of the fragmented nature of the identified areas. It has high opportunity cost because it converts high value lifestyle and residential land into a low value disposal area, and negatively impacts a large number of people. It is a high-risk solution because it is proposing disposal in a valley catchment, when the ability of the peninsula soils to take up the water and nutrients is not accurately known, and the sloping terrain and proximity to waterways increases both the probability and impact of failure. The proximity to residents exacerbates the collateral damage of such a failure.

- *Disposal to Robinsons Bay does not make beneficial use of the water either*. In the lower valley, it too has high opportunity cost and carries the same risks as Takamatua valley. Even in the upper valley, it is a high-risk solution because of unknowns in the ability of the peninsula soils and native trees to take up the water and nutrients, the sloping terrain and proximity to waterways, and the number of residents in the vicinity.

- Pompeys Pillar as a stand-alone option may be acceptable, but would not extract the maximum benefits from the water and does nothing to solve Akaroa's water shortages.

- Permanent harbour outfall makes no beneficial use of the water, and does nothing to solve Akaroa's water shortages. It fails to address the cultural concerns of Ngāi Tahu, now or in the future.

7. We present a detailed consideration of the options

- We have reviewed the latest Beca report and all the earlier technical reports, and draw attention to the many and substantial knowledge gaps and other issues identified in these documents
- We have researched land-based *disposal* systems elsewhere and are aware of a significant number of failures, principally due to nitrogen saturation and leaching. Our submission identifies that additional nitrogen removal over that proposed for the treatment plant would be necessary, and factors in the associated additional cost.
- We have researched recycling wastewater for beneficial *re-use* and find it is increasingly used to successfully overcome water shortages, often with a mix of different components taking up to the water, driven by demand.
- We present re-evaluated cost estimates based on the combined solutions we have presented, including our proposed variations to the details and costings of the consultation options
- We believe the cost estimates and assumptions in the consultation document should be subject to an independent peer review

8. Environmentally sustainable solution summary and costings – Non-potable re-use in Akaroa with residual options

We believe that the following cost estimates would apply to the solutions we propose, based on the information disclosed by Council to date and therefore subject to the same + or – 30%.

Option	Estimated Cost	Combined Total
Non-potable re-use in Akaroa (includes full nitrogen removal)	$3.5m	
Transitional mid-harbour outfall for residual	+$4.2m	**$7.7m**
Transitional Takapūneke outfall for residual	+$1.5m	**$5.0m**
Pompeys Pillar for residual	+$12.7m	**$16.2m**

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1 Introduction

Friends of Banks Peninsula has been involved with the Akaroa Wastewater issue for many years and we agree with the Council that the disposal of Akaroa's wastewater is a complex problem with no easy answers. However we do believe that progress has been made and the Council is now poised to develop an innovative and environmentally sound solution to this long-standing problem.

This submission presents solutions we believe would be acceptable to the community and environment through appropriate implementation of the options presented in the Akaroa Reclaimed Water Beneficial Reuse, Treatment and Disposal Options Consultation booklet.

Our submission opens with an introduction to the Friends of Banks Peninsula Incorporated society, and its long-standing involvement with the issue of Akaroa's wastewater. We draw a clear distinction between *disposal* and *beneficial re-use* of treated wastewater and describe the technical challenges facing land based *disposal* given the area's topography. The acceptable solution we then propose is based first and foremost around *beneficial reuse* of the water in Akaroa for external use, principally **garden watering,** and we provide reference examples where this is already done in other places. We present two different options for disposing of the remainder of the treated water during a transition period to 100% re-use in Akaroa. We identify and discuss the advantages and disadvantages of each.

We flag that costings associated with each option will need to be re-evaluated in the acceptable solutions and have attempted to do this using the latest information provided in the Beca[15] report dated on March 31, 2017.

We suggest that regardless, all costings in the consultation booklet and the Beca report are subject to a rigorous peer review as many constituents of the overall options have been changing rapidly in the period immediately prior to release of the consultation document, and expertise in relevant disciplines such as ecology and commercial marketing does not appear to have been included in the project design. In particular the concept of beneficial re-use in Akaroa has only been recently introduced and the solution needs more work. We offer to assist the Council with this process.

For clarity and completeness we also identify solutions that could potentially be developed from the consultation options that we do not support.

2 Background

The Friends of Banks Peninsula is an incorporated society founded in 1990. It works to protect and enhance the unique environmental heritage of Banks Peninsula and safe-guard the environment for future generations, with a focus on the Akaroa area. Our involvement with the Akaroa wastewater issue for many years means that we have read and analysed in detail many technical documents and presentations that underpin the options given in the consultation document. Hence our submission is based on a thorough understanding of the issues and how potential solutions have progressed and developed over the years.

2.1 Friends of Banks Peninsula objectives

The founding objectives of Friends of Banks Peninsula are to:

- Protect and enhance the environmental heritage of Banks Peninsula
- Encourage and support activities related to the maintenance and re-establishment of the flora and fauna of Banks Peninsula

- Act as an umbrella society to link individuals and small groups concerned with Banks Peninsula environmental issues
- Enable residents and visitors to become more involved in the environment and conservation of Banks Peninsula
- Work with local authorities and central Government to promote sound environmental practices

Achievements over the years include:

- Setting up the first recycling facilities in Akaroa, now managed through Christchurch City Council
- Extensive involvement with the District Plan and resource management process ensuring local environmental concerns are recognised
- Promotion of marine conservation and protection of the harbour and its wildlife and natural environment
- Many successful campaigns to protect the area from inappropriate developments including appeals to the Environment Court.

2.2 2008 Akaroa Area Water Services Working Party

Friends of Banks Peninsula actively participated in the Akaroa Area Water Services Working Party set-up in 2008.

We are part of a community with a strong desire to respect culture and heritage. We understand the cultural sensitivity of Takapūneke to Ngāi Tahu and its significance to the heritage of New Zealand. We agree that to operate a sewage treatment plant at this site is offensive. We note that it is from this shared desire to respect culture and heritage that the Akaroa wastewater issue principally arises. In the absence of such cultural and heritage issues, the relocation of the wastewater treatment plant and cessation of its associated harbour outfall would probably not be happening now.

However, through the Akaroa Area Water Services Working Party the society agreed that:

- A new plant be located away from Takapūneke Reserve
- The plant should be designed to produce wastewater that achieves the best quality possible at the time, and the membrane plant at Turangi was considered the minimum performance level acceptable.
- After much investigation into land disposal, it was found to be infeasible and hence an outfall located in mid-harbour was recommended, with the location to be chosen to maximise dilution of the wastewater. The outfall design was to facilitate extension to the ocean later if required.
- The design of the plant was to allow for beneficial re-use of the water and land irrigation would be trialled to determine parameters for better decision making.
- The cultural concerns of Ngāi Tahu would be managed by passing the water over or through land prior to harbour discharge.

The work of this first Working Party was informed by a Council-initiated feasibility study: *"Akaroa Wastewater Treatment and Disposal: Wastewater Options and Risk Analysis Report"*[1]. This report advised that irrigating ***all*** of the treated wastewater to land was not feasible because of the risk of instability during winter irrigation. The report concluded that a mid-harbour outflow presented the most cost-effective solution, but with the highest cultural concerns to local iwi. A "hybrid" solution irrigating some of the wastewater to land and discharging the rest via some form of land overflow

(e.g. constructed wetland similar to that constructed at the Blenheim WWTP) was also considered feasible and potentially acceptable to iwi, albeit at greater cost. For any form of land disposal the report recommended that the solution be staged such that the volume of water irrigated was increased gradually over many years and as the actual risk of instability or other adverse effects was ascertained through careful monitoring.

2.3 Consent application and decision

The Council's 2015 consent application to relocate the plant to the top of Old Coach Road and the outfall to a mid-harbour discharge was largely in-line with the 2008 Working Party's recommendations and as there were not matters of great concern to the Friends of Banks Peninsula and no community groups approached it, the society did not participate in the consent process. With hindsight this was unfortunate, as it meant we did not participate in the subsequent appeal of the decision to decline the harbour outfall.

The approach taken in the 2015 consent application had been one of the harbour as a permanent solution based on *disposal* of the water. Re-use was mentioned, but there was no serious commitment to follow-up with definite actions. We appreciate the Commissioner's point that the sunk cost of this harbour outfall could well dissuade future investment in a re-use approach. We believe that had the Council shown a genuine commitment to re-use the consent might have been approved as part of a transition to a longer-term solution and a "last resort" emergency outflow during prolonged wet conditions.

2.4 2016 Consultation

Faced with the task of investigating land-based options after the harbour outfall had been declined, the Council yet again took a *disposal* based approach. Options considered were based on finding the minimum amount of land meeting purely geo-technical considerations rather than looking for solutions based on beneficial re-use - such as the Commissioner's suggestion of setting up an irrigation scheme on a large remote farm and then on-selling it as a commercial enterprise.

Nevertheless, the approach did break new ground, in particular introducing the concept of accumulating wastewater during the winter in very large storage ponds.

In April/May 2016 the Council carried out its initial consultation exercise on a range of land-based and coastal infiltration options. We were impressed by the calibre of submissions from Takamatua residents concerned about the ability of their valley to absorb the additional water and the proximity of many residences to the areas selected for irrigation. They urged Council to adopt a higher treatment level and to re-use the water in Akaroa. What support there was for land irrigation favoured trees, but with the proviso that much further investigation and research was needed.

Harbour outfall was the most popular response to this consultation.

In the end further geo-technical work revealed that the principal area identified for disposal irrigation on the Takamatua headland was unsuitable, and the Council was forced to look for new options.

2.5 Revised study area options announced

New proposals were released to the public at a meeting held in the Gaiety Theatre in Akaroa in November 2016. It was disappointing that the new options did not take account of the Takamatua submitters concerns, and once again the Council chose to focus an intensive *disposal* approach, limited its consideration largely to geotechnical issues, and ruled the Akaroa catchment out of the study thereby negating the ability of Akaroa to be part of the solution to its own problem.

Friends of Banks Peninsula re-engaged with the wastewater process at this point when it was approached by community members from Robinsons Bay, deeply concerned about the impacts on their local environment. The new proposals had identified irrigation areas on many residential and

lifestyle properties in Robinsons Bay as well as Takamatua valley, with setbacks from houses and streams of only 5 metres for drip irrigation or spray irrigation within 25 metres. While the Council claimed the water would be treated to a safe standard, it also acknowledged that at times of heavy rain, infiltration of the sewage network with storm water would overwhelm the plant capacity and bypass flows with a much lower treatment standard would be released to the irrigation ponds. Furthermore, the huge ponds themselves would be located close to homes potentially ruining the amenity of the areas and drastically reducing property values of those affected. Residents were unanimous in their view that trees planted right along these valley floors, or the introduction of large areas of spray irrigation would completely change the amenity of these rustic pastoral valleys and have a major impact their lives, both properties identified for irrigation and the surrounding neighbours. The stigma associated with having the ponds and irrigation of wastewater foisted onto them was acute, and owners with properties on the market felt the direct brunt when their properties failed to sell.

2.6 Technical Experts group

Friends of Banks Peninsula's first step was to seek advice from Andrew Dakers of EcoEng, a highly respected wastewater engineer whose work had underpinned the original Harrison Grierson report in 2010. His view was that before he could give such advice, he needed to engage with the Council's engineers to better understand the groundwater and soil modelling being used to develop the parameters underpinning the new options. In response the Council formed a Technical Experts group, working under an Environment Court protocol. This group reviewed technical aspects of the investigations undertaken so far, considered community concerns and identified areas requiring further investigation.

2.7 Community Strategy Principles

At the end of January, 2017, Friends of Banks Peninsula presented the "*Community Strategy toward an Acceptable solution to the disposal of Akaroa Wastewater"* to the Banks Peninsula Community Board. 18 residents from Takamatua valley and Robinsons Bay travelled to Lyttelton to make the delegation and a further 58 sent apologies.

The *Community Strategy* proposed working collaboratively with the Council to find a solution with broad acceptance through the application of principles to govern the selection of wastewater disposal sites, these being:

Principle A.	**Wastewater treatment must be consistent and to the highest standard**
Principle B.	**Disposal must be in the right area, not one that externalises risks and costs onto adjoining residents, or destroys the amenity or health of the environment**
Principle C.	**Solution must be sustainable in the long term and robust in the event of natural disasters**
Principle D.	**Solution must meet Ngāi Tahu cultural values**
Principle E.	**Akaroa must be actively involved in the solution**
Principle F.	**Managed process and infrastructure**
Principle G.	**Ideally find a solution that makes beneficial use of the water**
Principle H.	**Obviate the need for compulsory purchase**
Principle I.	**Options put out for public consultation must be sufficiently detailed for the public to make an informed choice**

2.8 2017 Akaroa Treated Wastewater Reuse Options Working Party

Friends of Banks Peninsula was pleased that the Banks Peninsula Community Board responded by forming the Akaroa Treated Wastewater Reuse Options Working Party, with members drawn from the Board, and affected communities and rūnanga. It was attended by technical staff and had the ability to send questions to the Technical experts group. The Working Party met seven times in a series of intense and sometimes gruelling sessions.

Friends of Banks Peninsula made two significant presentations to the Working Party asking for technical issues to be more fully addressed and presenting an alternative solution to those tabled by the Council at the time. The alternative was based on a distributed network of ponds and irrigation facilitating re-use in Akaroa.

As a result of the Working Party discussions and the support it received from the Technical Experts, Beca, PDP engineers and the Council staff working through these issues and alternatives, several significant improvements to the original proposals are now in the consultation options. These include:

- Addition of Pond Site 10 on Old Coach Road, opposite the new treatment plant site. This was agreed by all at the Working Party as the best option for the principal storage pond, as it facilitates re-use in Akaroa as well as the other options;
- Commitment by Council staff to remove the bypass flows concept and instead increase the capacity of the plant and include a pre-plant storage pond to ensure that all wastewater passes through the full treatment process;
- Engagement and negotiation with the landowners at Pompeys Pillar to work toward arrangements that work for them;
- Recognition that irrigation around residential properties is problematic and that a greater distance from residential properties is an important consideration over and above geo-technical feasibility;
- Re-evaluation of re-use in Akaroa and determining that 25% of the water could be used immediately on a combination of public toilet flushing and municipal park watering.

The latter was considered a critical step forward by Friends of Banks Peninsula. A key issue repeatedly identified by the community has been the quality of the treated wastewater. Having the Council prepared to use the water in public places demonstrates its own confidence in the water quality and provides a strong incentive to keep that quality up.

3 Distinguishing between Disposal and Beneficial Re-use

Throughout the submission so far, we have made a distinction between *disposal* and *beneficial re-use*. This distinction and its implications for the receiving environment, promotion of voluntary use of the water and storage requirements are important considerations in the remainder of this submission.

Soil moisture levels are the critical factor in distinguishing between land disposal and beneficial re-use of wastewater– a distinction that the consultation booklet fails to make, but one that is vital to understanding and building acceptable solutions from the options provided in the consultation.

Under a *disposal* system, the water is distributed to the receiving environment whether the environment needs it or not. The purpose of the irrigation is not to benefit the receiving environment, but to dispose of the maximum amount of water.

When the water is put to *beneficial re-use*, the level and times at which it is irrigated or used are determined by the needs of the receiving environment. For example a garden or farm paddock will be watered only when it is dry and the plants will benefit from the water, not when soils are already moist and additional water would not add benefit, or indeed could be detrimental. Toilets will only be flushed when they have been used.

3.1 Potential cost savings with a Beneficial Re-use approach

An advantage of beneficial re-use is that because the water is applied in a beneficial way, landowners are likely to want the water. Conversely with a disposal system landowners are unwilling to take it on a purely voluntary basis because of the level of ground saturation involved. They are forced to irrigate whether it makes sense to or not.

Because the approach taken by Council to date has been one of *disposal* costings of the options all include lease or purchase of the required land.

The inclusion of beneficial re-use in Akaroa at a very late stage in the process, and immediately prior to release of the consultation document, has meant that *re-use* options and the implications for land and storage costs have not been as fully considered.

Later in the submission we explore how solutions that provide a benefit to the landowner could also result in cost reductions. Furthermore, under a beneficial re-use model the risks are lower because the irrigation rate is reduced. This combination enables additional land to be considered over and above the minimum size and we note that it was this type of approach hinted at by Commissioner Collins in the decision[2].

3.1.1 Long term cost spreading

We suggest that there are also cost implications for spreading the load over several years, sizing infrastructure according to need, and deferring some costs until later stages as needed.

4 Challenges with land irrigation on Banks Peninsula

We respect that irrigation of wastewater to land meets Ngāi Tahu cultural concerns and appreciate that passing through top-soil has positive benefits for the absorption and neutralising of residues in wastewater such as viruses, provided that the top-soil is not saturated. However, expert advice confirms concerns that the topography and geology of Banks Peninsula present significant challenges to land disposal as most of the land is steep, with the volcanic bedrock coated in a layer of slip-prone loess soil. Stream gullies and ephemeral streams punctuate the slopes, testament to the huge volumes of water that cascade down to the valley floors below in heavy rain events.

4.1 Risk of slips and flooding

Over the last 100 years every valley within the inner harbour has suffered from flooding. During extreme rain events the water cascading down the slopes swells the streams into massive torrents – the noise of boulders rolling in the creeks is a feature at such times – and the streams can break their banks. Much more serious flooding has been experienced when blockages have occurred up-stream during these events either by debris washing down the stream, or by a slip. Then huge volumes of water can become trapped and release destructive flash-floods to areas below when the blockage subsequently breaches. Extreme rainfall events are often highly localised with massive cloudbursts occurring in one catchment, but not another, and with no set patterns[3].

Loess soil loses its strength as it gets wetter and there is a limit to the level of moisture the soil on slopes can safely absorb before ground water mounding (a locally rising water table) exacerbates slip risks. Hence the geologically suitable areas identified by PDP have been limited to slopes of no more than 19^{o}, with the additional restriction of slopes below irrigated areas of no more than 15^{o}. This

latter requirement has ruled out many of the flatter headlands and ridgetops and reduced the suitable land within 10km of the treatment plant to the populated valleys of Robinsons Bay, Takamatua, and the remote headland of Pompeys Pillar on the outer coast.

4.2 Storage ponds

In order to cope with periods when the soil moisture levels are too high to irrigate safely, the scheme proposed for the Akaroa Wastewater land irrigation options includes large storage ponds, sized to hold most or all of the water flowing out of the treatment plant during winter. No irrigation to pasture is proposed for winter but it is considered, based on theoretical modelling, that some irrigation to trees will be possible as an established tree canopy intercepts some rain and prevents it from reaching the ground. Ponds proposed for tree irrigation are therefore somewhat smaller than those for pasture.

4.2.1 Community acceptance

While they provide a solution to dealing with winter flows, the large storage ponds present one of the most difficult aspects of land-disposal. Residents have expressed concerns about the ponds breaching during earthquakes or other natural disasters and flooding areas below. The Beca reports acknowledge there could potentially be issues with odour and/or midges. The large storage ponds are likely to be visually intrusive in the landscape as they will be lined and during summer the aim is for them to be nearly empty. If visible, they will not appear as natural features. They will need to be well screened.

4.2.2 Pond Overflow in prolonged wet weather

All the land options proposed are essentially closed systems. All water is to be captured and stored in the ponds and then irrigated to land. Should there be a prolonged wet period or a sequence of wet seasons, with a low take-up of water from the voluntary uses and the disposal fields becoming saturated, then the excess water must go somewhere. The consultation document states on Page 9 that all ponds will include a spillway and that if the pond capacity is exceeded the water will overflow and *"make its way to the nearest stream"*.

There is no detail on whether or how such overflows would be managed or the potential impacts on the streams, particularly if the overflow continues for some time, meaning the stream is effectively receiving all the wastewater from Akaroa until such time as the land has dried out enough to resume irrigation. Nor is there an assessment provided on whether this is compatible with Ngāi Tahu values.

This risk is somewhat mitigated by the system being designed for 2041 flow levels, and therefore including a margin above the current levels. However, we note that this also means a greater sunk cost is being incurred now, with no actual guarantee that in a series of wet seasons the system could actually cope without resorting to prolonged stream disposal.

The risk of pond overflow is one of our biggest concerns with the current closed systems proposed for land irrigation and a matter that needs further consideration, particularly given the changing climate we are now experiencing. Although Banks Peninsula is predicted to get drier overall, increased storm events and more unpredictable weather could also occur. Our solutions address the issue of pond overflow.

4.2.3 Sizing

The Beca report identifies that storage volumes are indicative only and that correct sizing is critical to success. If the capacity turns out to be inadequate, they will spill to the neighbouring streams.

4.2.4 Pond site 10

We agreed with the other members of the Working Party that Pond Site 10 opposite the new treatment plant site is the best option for the principal storage pond. It facilitates re-use in Akaroa and is further from residences than most of the other proposals. There is good visual separation already provided by roads and well-established stands of trees. The pond at site 10 would not

impact on views from residential properties and would already be invisible from the state highway except from high vehicles. Further screening to prevent views from these could be established quickly without shading the state highway.

However, we recognise that residents of the Old Coach Road area are likely to have concerns. Not only is the treatment plant to be located there, but now, if land disposal proceeds, also the principal pond.

We suggest that the pond should be covered at all times. This will minimise the remaining potential effects of this pond on neighbours such as odour and midges and ensure that the reclaimed water is not fouled during storage by geese or other wildlife.

The pond must be constructed to the highest engineering standards and the position of its spillway and receiving environment still needs to be identified.

4.2.5 Storage implications of Beneficial Re-use

An important trade-off to recognise is that greater the percentage of the water being directed toward beneficial re-use, the greater the need for water storage. Demand will be limited to the times when the water is needed, whereas under a disposal system, the water will be irrigated until much higher parameters based around land slippage thresholds and soil moisture saturation are reached.

Finding creative ways to store the water, such as requiring voluntary users to provide storage or distributing storage into multiple micro-ponds or tanks will form part of the solutions proposed later in this submission.

4.3 Irrigation methods

The consultation document proposes that water would be disposed of to land via spray irrigation to pasture or drip irrigation to trees, without giving further information on how this would be implemented or the challenges either pose in the locations proposed.

4.3.1 Spray irrigation to pasture

Spray irrigation to pasture is generally used for land disposal in conjunction with a cut-and-carry regime. Pasture heavily irrigated with nutrient laden water grows quickly as the grass takes up the nitrogen and is then cut regularly to promote continued growth. This requires the land under irrigation to be suitably graded for tractors to pass over and could potentially introduce a level of farming intensification not currently experienced in the valley floors proposed for irrigation.

Spray irrigation to pasture that is grazed would either need to have more nitrogen removed at the treatment plant or be spread over a larger area, as the animals themselves are continually returning nitrogen to the ground.

There can be market restrictions on baleage from wastewater irrigated pasture and stand-down periods for stock depending on the treatment level of the wastewater.

4.3.2 Drip to trees

Most land disposal systems to trees have been installed into established pine forests. As no established forests are available on land meeting the geo-technical criteria, the consultation options propose to plant a new area in native trees. There does not appear to have been an ecological assessment of the appropriate mix of species to absorb the water, the methodology for husbandry during the period of establishment, how long it would take before such trees were able to take the full irrigation load proposed, and the impact on root growth and tree health from watering during the establishment period.

Friends of Banks Peninsula understands that the Council proposes to continue using the Takapūneke treatment plant while such trees establish and only use the new treatment plant for the water that is to be irrigated onto the new trees.

We are concerned with the lack of both ecological and social assessments of the proposal to establish new native forest using irrigation. Trees subjected to watering during the period while they are being established are likely to be shallow rooted, and therefore prone to blowing over in high winds later. This tendency is exacerbated when planted on sloping ground. They are also more susceptible to fungal disease. During the establishment period, such trees will need extensive weed control and management to prevent hare damage. The management method is not discussed in the Beca report and we suspect it has been largely overlooked, and the significant costs of husbanding many hectares of newly planted trees during their establishment period is therefore omitted from the costings.

Trees planted close to property boundaries and near houses are likely to have amenity affects through shading, blocking views and dependent on the species chosen, potential increase in fire risk. The management method during establishment is also likely to have amenity affects.

4.4 Experience elsewhere with land disposal

Friends of Banks Peninsula has undertaken considerable research into the success or otherwise of land-disposal systems elsewhere. We have studied the small system at Wainui across the harbour from Akaroa, and much larger systems at Rolleston, Leeston, Selwyn Huts, Ashburton, Rakaia, Methven and Rotorua.

All of these systems feature year round *disposal* irrigation either to pasture managed under a cut-and-carry system or into well-established pine forests.

No other systems require large volumes of winter storage, nor can we find any other system irrigating to native trees or newly established trees.

4.4.1 Nitrogen leaching

Several other land disposal systems have encountered issues with nitrogen leaching, including Whakarewarewa (Rotorua), Leeston, Selwyn Huts and Ashburton. In all four cases the land treatment system design was intended to remove nitrogen from the wastewater through uptake via the grown vegetation, soil, and optionally a wetland, and in all the cases the system has failed to perform as designed, with the land treatment systems unable to perform within consent limits for nitrogen:

- Whakarewarewa is being closed because of nitrogen leaching into the Puarenga stream, and the wastewater will be returned to Lake Rotorua[4].
- The Leeston field has already been increased in size once because of excessive nitrogen loading[5] but still leaches nitrogen into Tramway Drain, breaching its consent conditions.
- Selwyn Huts has never worked satisfactorily and leaches nitrogen into Lake Ellesmere[6].
- Ashburton's wetland has failed resulting in excess nitrogen, blocking of irrigation equipment and regular overflows into the Ashburton river[7].

The Technical Expert group has noted that nitrogen leaching is a potential issue, and that the movement of groundwater at the sites under consideration has not been fully investigated. **The risk of nitrogen leaching is essentially therefore still unknown.**

We are concerned that the irrigation rate (and consequent nitrogen loading rate) presented in the consultation options has been based on the Wainui disposal scheme. In granting consent for the Wainui scheme the commissioner explicitly noted that the nitrogen load proposed was permissible because of a *lack* of water resource in the irrigation area. In contrast, the areas proposed for

irrigation at Takamatua and Robinsons Bay contain streams and water bores which have the potential to be directly impacted by nitrogen leaching from the irrigated land. Potential effects of nitrogen leaching include harm to sensitive whitebait spawning areas including the popular Robinsons Bay stream[8].

4.4.2 Field failure and growing pains

The Whakarewarewa, Leeston, Selwyn Huts and Ashburton land treatment systems have all failed to meet their design performance standards. At Whakarewarewa the Puarenga stream running through the middle of the disposal forest is now considered one of the most polluted in New Zealand, forcing the Rotorua District Council to return the discharge to Lake Rotorua despite opposition from some iwi[9]. Leeston's dispersal field has already been more than doubled in size and its border dyke and rapid infiltration design replaced with spraying because of nutrient buildup, yet both it and Selwyn Huts have ongoing nitrogen loading, effluent ponding and compliance breach issues, and were identified as the major priority for the Selwyn Waihora Water Management Zone committee[10]; Ashburton, Rakaia and Methven land treatment systems have all outgrown their designed areas, with Ashburton and Rakaia requiring a doubling in land area[11]; Ashburton's award-winning constructed wetland has failed, with this and other problems causing significant operational and consenting issues[7].

4.5 Future climate and population trends

Predictions for Banks Peninsula are that it will get drier overall with stream flows expected to reduce from between 20 to 100%. Increased storm intensity and frequency is already exceeding predictions, the position of Banks Peninsula, jutting into the Pacific ocean makes it particularly vulnerable to storm damage and extreme rainfall events. The consultation booklet sets a 25 year timeframe on the new system but in practice anything built now is likely to be the basis for Akaroa wastewater disposal for a much longer period.

Population growth is another long term affect that needs to be considered. Demand for water in Akaroa is likely to increase as its resident and holiday populations grow, and land in the neighbouring valleys provide opportunity to absorb some of this growth.

Any solution put in place now should be mindful of the direction it sets for an extremely long timeframe and ensure that it is building resilience in Akaroa to face the challenges ahead of both climate change and an increasing population.

4.6 A New Zealand first

The land disposal system proposed for the Akaroa wastewater would break new ground in New Zealand on several counts.

4.6.1 Winter storage a first

It is the only system requiring large volumes of water to be stored over winter. This storage level itself potentially creates problems of water stagnation and subsequent release of odour. As previously discussed a potentially significant environmental issue is that water would be released to nearby streams if the storage becomes full due to a series of wet seasons, negating the ability of the land to absorb nitrogen and neutralise pathogens.

4.6.2 Irrigation to native trees a first

The idea of disposal irrigation to newly established native trees is also new. Native trees generally have a lower uptake of nitrogen than pine trees, and choice of species to those having high water uptake would be essential. Kanuka, for example, which frequently appears as an example species in the reports, prefers dry feet and is not likely to respond well to watering, particularly to a disposal regime in which soil moisture levels are kept high. It is also is poor at removing nitrogen[12].

A disposal system to newly planted trees will take several years to establish. Irrigation levels must be much lower before the canopy has developed and is ready to absorb rain.

We are **not recommending** that this approach is used in our submission.

4.6.3 Beneficial re-use may overcome some issues

Beneficial re-use would be a New Zealand first too, but we believe that it will overcome some of the issues facing irrigation on the Banks Peninsula topography, because the water would be applied at the rate needed by the receiving environment. This means it will be spread over a wider area on an as-needed basis and is therefore likely to be at a much lower intensity of application, as informed by soil and plant conditions. The risk of saturating the ground to the point where slips or flood risk is elevated is much less than with a disposal system based on maximum hydraulic loading.

5 Quality and Quantity - Reducing the problem

The consultation document is silent on a number of matters that could significantly improve the quality of the wastewater and reduce the total volume. Friends of Banks Peninsula submits that these matters must form part of the solution to the Akaroa wastewater issue.

5.1 Highest Treated Water quality

The wastewater quality has been identified as a fundamental issue at all community meetings run by Friends of Banks Peninsula. The higher the quality of the water, the more comfortable people feel about using it, or having it disposed of nearby to their properties. The community has consistently told us and the Council that if the water is treated to the highest standard they would be prepared to re-use it.

Hence, the Community Strategy has adopted as its first principal:

Principle A. Wastewater treatment must be consistent and to the highest standard

We now put forward ways in which the water quality could be treated and maintained at the highest standard.

5.1.1 Capturing flows during heavy rain

During heavy rain events stormwater infiltrates the sewer pipes leading to a considerably increased volume of wastewater, potentially beyond the capacity of the treatment plant. The original intention, prior to the Working Party meetings, had been to treat this to a much lower level before disposal. The Council now proposes to capture and fully treat all of the high level flows during heavy rain. This is a critical step to achieving a consistent high standard of treatment and water quality and we commend the Council staff for taking it.

5.1.2 Treatment standard

Residents are concerned about the residues that will be in the water when it exits the plant, including viruses, hormones and endocrine disrupters. The current treatment standard proposed which produces water unsuitable for use with salad crops is likely to discourage re-use by the public.

We submit that the Council should increase the water quality standard so that it can be used to water all food crops, including salads. As elsewhere where water is re-used, the Council should put in the highest level of ultrafiltration, combined with post-treatment disinfection of any water being returned through the purple pipe network.

Concerns would be substantially mitigated if the Council does indeed re-use the water itself in public places. Not only would this inspire public confidence initially, it would also be seen as a check on keeping the Council "honest" in maintaining those standards, as it will have "skin in the game", which is not the case if all the water is shunted off to a remote out-of-sight, out-of-mind location.

We suggest that at least some of the municipal watering needs to be above ground and using the type of sprayers that people would use in domestic gardens to encourage confidence. We suggest a demonstration garden, including vegetable and salad crops.

Community members have asked for a reverse osmosis treatment system to be included in the plant. We recognise this is expensive and some other places ensure water safety by disinfection (e.g. chlorination) after filtering, the method recommended by the US-EPA[23].

5.1.3 Nitrogen – a critical environmental issue

The issue of nitrogen levels in the water has not been clearly addressed in the consultation document, but significantly impacts on the viability of some of the options. On Page 8 the consultation document states that *treatment plant design could be changed to achieve a total nitrogen concentration of 5 g/m³ if needed to avoid adverse effects on the receiving environment,* but does not give any information about whether this is planned for any of the proposed options, or what it would cost.

The treatment level proposed by Council includes a nitrogen concentration of 20-30g/m^3. As highlighted in the consultation document, this is quite poor by today's standards (e.g. Turangi, around 7g/m^3). Water NZ would only give the proposed plant a nitrogen rating of B. Even modern on-site effluent treatment systems (septic systems) such as Oasis achieve levels less than 15g/m^3, the maximum allowed in the Rotorua Lakes district, for example.

As already described, nitrogen build-up in soil is emerging as a serious issue for many of the longer-running land treatment systems. It was previously thought that large quantities of nitrogen could be removed via soil take-up and vegetation growth, but it has become clear that this is not the case[4]. First, it was assumed nitrogen taken up by soil would break down and be released as gas, but this does not happen to any significant degree. Second, the amount of nitrogen removed by vegetation (particularly trees) is much lower than previously thought: at Whakarewarewa the current removal by mature pine forest is *at most* 12%, and as low as zero. Another option for removing nitrogen is artificial wetlands, but these too appear to have limited effect, removing just 12% of all nitrogen applied at Whakarewarewa.

The Council proposal to irrigate to native species such as Kanuka further exacerbates the problem. Kanuka's nitrogen uptake is thought to be as low as less than 20% of applied nitrogen[12], which would leave the majority accumulating in the soil until it leaches out into the nearest groundwater. Other natives do not fare much better.

5.1.4 Nitrogen removal requirements

The appropriate level of nitrogen to remove at the treatment stage depends on which of the disposal options is being considered, and, in particular, whether at-risk water bodies are present.

With beneficial re-use in domestic gardens, the Council would have no control over the species being watered, so it would be prudent to err on the safe side and provide full nitrogen removal. We have made several further comments on nitrogen removal in Appendix 4.

Beca have estimated the capital cost of maximising nitrogen removal (estimated to reduce the final concentration to 5g/m^3) at an additional $1.8 million. Given that our proposed solution for 100% re-use in Akaroa as the end result, we have included this cost for full nitrogen removal in our revised costings.

5.1.5 Mitigating Plant failure with an outflow buffer tank

The environment could also suffer adverse effects if the Treatment plant itself were to experience a malfunction, and wastewater outflowing is at a lower standard than normal. It is our current understanding that such lower standard water would flow directly to the main storage pond, potentially lowering the standard of the whole volume it contains (as the bypass flows did in earlier designs).

To minimise the risk of such water polluting the pond and reducing the quality of the reclaimed water, we suggest that water is captured in a small buffer tank as it is emitted from the plant and held there until it is cleared as suitable for onward flow to the main storage pond - perhaps daily. In this way if there has been a failure of the plant and substandard water has been emitted, it can be sent back to the treatment plant for re-processing.

5.1.6 Covering the pond

As stated earlier, we consider that the main storage pond should be covered to ensure that the water quality is not diminished through subsequent fouling, such as from flocks of geese.

5.2 Minimising outflows

Growth of the town has meant that in recent years additional water has been piped over from Takamatua to boost the supply. All water supplied in Akaroa is treated to a potable standard, whether it is intended for potable uses or not. A reduction in the volume of potable water being used for potable uses will also lower the amount of wastewater. Combined with re-use of treated wastewater in Akaroa for non-potable uses, potable water usage and wastewater outflows could be reduced, making savings on both the the infrastructure and land area required for dealing with wastewater, and potentially reducing costs of providing the potable supply. We suggest this is examined and costed to establish what reductions would be achieved.

5.2.1 Minimising Infiltration

Outflow data from the existing treatment plant indicates much less difference between winter and summer flows than would be expected given the highly seasonal nature of the Akaroa population. This suggests that there is a base level of infiltration into the sewer pipe network from groundwater.

The Council has estimated that over 300m^3 of potable water is lost from its potable water reticulated network every day[13]. This potable water loss is clearly “money down the drain”, but could also be a potential source of infiltration into the sewer network, making a double cost whammy.

The other source, stormwater, has been identified by Council staff, and we are aware that efforts are in progress to reduce this infiltration and that to date they are meeting with success. All further reductions in such infiltration will reduce the costs of running the treatment plant and the volume of land disposal. We urge the Council to continue with its work to reduce stormwater infiltration, and suggest that it require all households in Akaroa to actively demonstrate that stormwater from their properties is not infiltrating the sewer network.

5.2.2 Water conservation

Nowhere in the consultation booklet is the issue of water conservation mentioned. Currently Akaroa suffers from water shortages every year and essential conservation is achieved through the blunt instrument of summer watering restrictions. This year they were still in place at the start of April.

We make the following suggestions on conservation measures:

- In urban Akaroa, residents, businesses and visitors must be better informed of the consequences of wasting water and encouraged to be more responsible for water use and disposal.
- The Council should embark immediately on a programme to promote responsible water use in Akaroa and:
    - Lead the way with an audit of its own facilities including leaks and wasteful consumption at public toilet facilities
    - Install dual flush toilets and metered taps at basins
    - Investigate the pressure of the reticulated water supply (which is unnecessarily high in some areas) and consider ways to adjust this so as to reduce water wastage.

- Provide information to residents, visitors, businesses, school, etc. on the consequences of overuse and the need to reduce water use, and ways to achieve this.
- Provide information and incentives to property owners and developers to install water efficient taps, toilets and appliances.
- Research the incidence of chemicals and harmful materials (cleaning products, microbeads, medicines, drugs, etc.) entering the waste system, and provide public education to minimise risks.

Water metering was introduced some years ago, but there have been no meaningful incentives to reduce usage such as usage based charges to recover costs of treatment, or caps imposed on free usage, and charging thereafter. These could provide the Council with powerful tools to incentivise reduction in the usage of potable water, particularly if an alternative supply for the much heavier non-potable use of garden watering was supplied, and if up-take was slower than desired.

5.2.3 Re-use in Akaroa

The *Community Strategy* suggests that Akaroa needs to be part of the solution. This submission proposes a win-win approach with re-use of wastewater to reduce Akaroa's chronic water shortages and to cut down on the wastage of potable water. The cost of providing sufficient potable water in summer will fall and, if less water is taken, it will have positive impacts on the streams in Akaroa, where water usage places further demand on already low flows. Thus cost and environmental benefits will be reaped and people will be able to enjoy watering their gardens and other external uses without the level of restrictions currently imposed every summer.

6 Beneficial Re-use of treated wastewater in other countries

As fresh water becomes scarce, the world has increasingly turned to recycling as a means of increasing supply. The World Health Organization identifies the following principal driving forces for wastewater reuse[19]:

- increasing water scarcity and stress,
- increasing populations and related food security issues,
- increasing environmental pollution from improper wastewater disposal, and
- increasing recognition of the resource value of wastewater

Today, wastewater is reclaimed for a wide range of uses: in the US, treated wastewater has irrigated San Francisco's Golden Gate Park since 1932, and in Orange County reclaimed wastewater has recharged groundwater and prevented salt water intrusion since 1976[20]. A substantial proportion of wastewater is reclaimed in Spain, Italy, Germany and Greece.

Today wastewater is commonly applied to a wide variety of uses, including irrigating parks and golf courses, sporting facilities and private gardens, vehicle washing, toilet flushing, agricultural irrigation, artificial lakes and wetlands and groundwater recharging. Provided the wastewater has been suitably treated, it can even be drunk: Singapore's NEWater is treated using Reverse Osmosis and UV light to a standard that allows it to be returned directly to the drinking water reservoir[21]. Indirect potable re-use is fairly common in the US[22].

Akaroa could be recycling its wastewater to ease pressure on its water supply. The technology is mature and widespread.

7 Environmentally sustainable solution based on Option 4 - Non-potable re-use in Akaroa

We now present the solution to the disposal of wastewater that we consider would be environmentally sustainable and acceptable based on Option 4 - Non-potable re-use of the treated water in Akaroa.

We discuss the conditions that would need to form part of the solution, assess it against the Community Strategy principles and then consider the short term implementation, the long term picture and comment on the costings presented in the consultation booklet.

Although the consultation booklet identifies that Option 4 would only absorb 25% of the wastewater and must be used in conjunction with another option, we calculate that external usage (principally garden watering) would rise to 100% once a purple pipe reticulated network was in place delivering it to all the population.

We recognise that it will take time before non-potable re-use in Akaroa accounts for 100% of the treated water, so another method will be needed during the years of transition, and may also be needed as a back-up should a wet summer lessen the demand from Akaroa itself.

Hence after our assessment of Option 4, we then present two alternative solutions for the re-use or disposal of the remainder of the water during the transition period.

7.1 Conditions

Our support for Option 4 is based on the following conditions:

- There are no bypass flows. All wastewater is fully treated to the same high standard.
- The water is treated to a level suitable for watering of salad crops. We suggest the highest level of ultra-filtration followed by disinfection(such as chlorination).
- The bulk of the stored water is at Pond Site 10 at Old Coach road.
- Full nitrogen removal is included in this solution.
- Post-treatment flows are closely monitored and re-treated if standards are not met, rather than contaminating the stored wastewater.

In the event that Council pursues a resource consent application that includes bypass flows, large storage ponds in unacceptable locations or fails to include full nitrogen removal, it is likely the community will actively oppose such a consent.

7.2 Achieving 100% usage

Our conclusion that Option 4 is the best solution is strengthened by data given in the Beca report[15] on Akaroa's current water usage, the estimated amount used for external activities, and the volume of wastewater currently processed. This shows that the external use is more than the entire wastewater flows in 2015 or 2016, and we are therefore confident that once the purple pipe network was reticulated throughout Akaroa all the wastewater flows could be re-used for external non-potable uses, principally watering gardens. See Appendix 3 for further detail on how we have reached this conclusion.

7.3 Assessment against Principles

Re-using the wastewater in Akaroa, providing that it is carefully done, meets all the principles of the Community Strategy, as assessed in Appendix 2, although we do discuss some reservations about aspects of the proposal in the consultation booklet.

We commend the Council for showing leadership through watering public areas and showing how the water can be used for flushing toilets but suggest that a demonstration garden will also be needed. We consider that this will greatly increase confidence in the quality of the water and is likely to lead to a rapid uptake by the voluntary sector in Akaroa, particularly for garden watering over summer, and particularly if the water restrictions remain in place for residences connected only to the potable supply. The grass will indeed be greener on the other side of the fence of neighbours who have hooked up to the passing purple pipe supply!

7.4 Short term implementation

The consultation document suggests that the network planned initially includes all the public toilets and L'Aube Hill and Stanley Park, but gives no further information on the pipe-runs proposed. There may be an opportunity for the Council to offer domestic connections from these first pipes as they are laid and gain more uptake of the water than is currently proposed.

We do have some concerns about using the water to irrigate L'Aube Hill and Stanley Park initially. Although we recognise the watering rate is reduced and irrigation will be seasonally applied, we feel the focus should remain on putting the water where it is most needed, rather than a quasi-disposal into Akaroa parks. We suggest that it may be more prudent to lay the pipe along the main public toilet run only (ie Recreation Ground to Britomart Reserve by the main wharf) and then along Beach Road to Greens Point as far as the last house and see what uptakes can be arranged along that route. The small waterfront reserves (such as around Daly's wharf, the War memorial, the area in front of the beach and Britomart Reserve) would appear more in need of the water than the larger L'Aube Hill and Stanley Park proposed, would be cheaper to implement and have a higher visibility. The work of laying underground pipes could be tied to improvements to these tired areas as part of a general Akaroa tidy-up.

We also suggest that some above ground irrigation will be needed to truly inspire confidence in the public to spray the water on their own gardens. We strongly recommend that the Council installs a demonstration garden in a prominent area of the town as an example. This should contain both ornamental plants and vegetable crops including salads. Potential locations would be Jubilee Park at the town's entrance or near the Petanque court on the Recreation Ground. The consistent message we have received at every community meeting is that people would welcome the water for their own gardens provided they had 100% confidence that it was safe.

7.5 Long term

Additional purple pipes could be laid when the streets are being dug-up for other purposes, and gradually connected to the network, and such work should be factored into the Council's long term plan.

Council will need to increase storage as take-up for this beneficial voluntary use increases. Friends of Banks Peninsula has already identified a number of potential small pond sites around Akaroa, and would envisage large tanks (such as Kliptanks – www.kliptank.com) or micro-ponds that are gravity fed from Pond 10 gradually being installed. These could then gravity feed back down to the purple pipe networks in adjacent streets.

7.6 Costings

Given that we expect full nitrogen removal to be needed for safe long term re-use in Akaroa's parks and gardens, we add an additional $1.8m to the costs suggested for Option 4. We have not included the cost of disinfection.

Table 1 Non-potable use in Akaroa costing

Components	Costing
CCC capital cost estimate in consultation document	$1.7m
Full nitrogen removal	$1.8m
TOTAL	**$3.5m**

7.7 Residual flows

An alternative disposal for the remainder of the treated wastewater will be required until such time as the full 100% of wastewater flow can be re-used in Akaroa. We have discussed how this could be achieved using a purple pipe network through the residential and commercial areas of the town providing non-potable water for use in gardens and other voluntary activities. There may also be other beneficial reuse options, such as nearby horticultural reuse, ground water recharge, establishment of biodiversity reserve areas that could take up part or all of the water but have yet to emerge or be explored. Overseas examples generally show the water is used for multiple purposes and this approach maximises the likelihood that all the water is taken up on a voluntary basis and more cost effectively. We signal that we continue to work on ideas to make more use of the purple pipe water.

The next sections of this document present two alternatives for dealing with residual flows until such time as the full purple pipe system is operational and 100% reuse achieved.

8 Residual flow to a transitional harbour outfall for disposal

Our preferred option is to use a harbour outfall to dispose of the remainder of the water such time as Akaroa re-use reaches 100%. We present two methods that are less expensive than the one proposed in the consultation document for routing the harbour outfall pipe. These both involve using the purple pipe network to Greens Point to deliver surplus wastewater to the harbour outfall rather than starting the pipe at Childrens Bay.

Once re-use in Akaroa has reached 100%, the harbour outfall could be either decommissioned or retained to provide an emergency overflow for extended wet weather periods. We consider this preferable from an environmental perspective to overflowing into streams because nutrients and other residues will be rapidly diluted and dispersed rather than accumulating in the silt bottoms of the shallow harbour bays.

The existing treatment plant at Takapūneke could be completely decommissioned as soon as the new treatment plant was operational.

8.1 Conditions

We recommend transitional harbour outfall on the basis that

- **A harbour outfall is used as an interim solution only** with reductions in clearly planned stages as corresponding infrastructure to facilitate re-use is implemented.
- The Council would commit and plan (through its Long Term Plan) to re-use all of the water in Akaroa on an agreed timeframe.
- All water is fully treated, no bypass flows.
- Full nitrogen removal is in place

8.2 Assessment against principles

A transitional harbour outfall scores well in several aspects, and not so well on others. Based on the NIWA impact assessment report[17] a harbour outfall with this level of treated water would create no health, amenity or environmental issues. What is of concern is that the harbour outfall is wholly for the purpose of *disposal*, and does not make beneficial use of the water. However, we are prepared to accept this given that the harbour disposal is an interim measure only and provides the most cost-effective way to facilitate the development of re-use in Akaroa.

The principles recognise that a harbour outfall is not palatable to Ngāi Tahu as a solution, and we recognise that in putting it forward as an interim solution we are asking them to wait longer for harbour disposal to be withdrawn. However, we do this on the basis that the harbour outfall will prove less expensive than setting up an interim land irrigation system and, with the bypass flows now omitted from the overall system, it improves the water quality and safety over that proposed in the 2015 consent application.

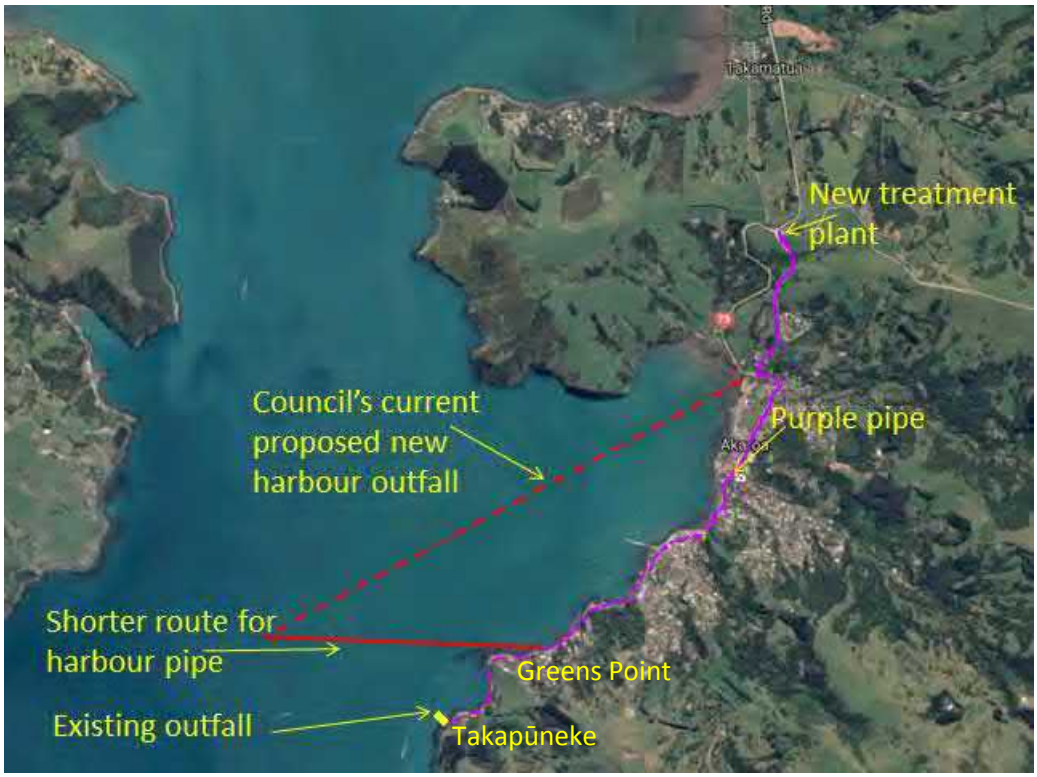
We also see real value in retaining some form of harbour outfall because it is the most environmentally sound, robust and sustainable emergency overflow outlet should the storage become full.

8.3 Short term implementation

We suggest that there are two different ways that a harbour outfall could be achieved (in conjunction with re-use) at a lower cost that the standalone and extensive underwater pipeline suggested in Option 5 in the consultation booklet. Both piggyback on the purple-pipe network, which is why we suggest it is initially laid along the Akaroa waterfront to Greens Point. Underwater pipe is much more expensive than land based pipe, and both of these options make use of the proposed purple pipe running under the road to reduce the amount of expensive underwater pipe needed.

The diagram below shows the purple pipe network running to Greens Point, and the two options. Either lay a new mid-harbour outfall starting at Greens Point, or extend the purple pipe a bit further to the site of the existing Takapūneke treatment plant and connect to the existing harbour outfall there.

Figure 1 Cost-effective harbour outfall options



New outfall from Greens Point

If the purple pipeline is run along Beach Road to Greens Point (the last house), and an underwater outfall pipe is constructed from there to the proposed mid-harbour location for outfall, the underwater component of the pipe would be approximately half the length of that proposed in the consultation document. BECA estimate an underwater pipe to be four times more expensive to build than over land, so the over land option is significantly less expensive. We consider this would go a long way toward addressing Commissioner Collin's concerns that the sunk cost of a harbour outfall would preclude investment in re-use. Under this proposal it would be less expensive and integral to that re-use.

We would be interested in whether there would be other locations for a new mid-harbour outfall that would be preferable to Ngāi Tahu over the location proposed.

Retain the current outfall from Takapūneke

If the purple pipe went a bit further, it could terminate at the existing treatment plant at Takapūneke and feed into the existing harbour outfall there. The plant could still be decommissioned when the new plant becomes operational; only a connection to the outfall itself would be required.

This option would be less expensive again as it would not involve new underwater piping, only a connection to the existing pipe, but does retain some infrastructure at the Takapūneke historic site, so may not be acceptable to Ngāi Tahu.

We would hope that the staged implementation of re-use in Akaroa would provide reassurance to the rūnanga that regular use of the harbour outfall for some flows was an interim measure only.

8.3.1 Storage implications

The Council have identified that they could re-use 30,000m^3 per annum irrigating municipal parks. This is roughly the volume of wastewater that is generated between November and March, so if

irrigation takes place over that period, minimal storage would be required. This seems an acceptable level of irrigation as it works out to the equivalent of 300mm of rainfall over that entire period, which would be a beneficial level of watering to reduce the summer soil moisture deficit without impacting recreational use of the parks by making the ground excessively damp.

The large and expensive storage ponds needed principally for winter storage could be deferred until the purple pipe network had been extended to the point where demand exceeded the summer wastewater flows. The costings we give below do not include these ponds, as they would be factored in later as part of the Long Term plan to bring all of Akaroa onto the reticulated purple pipe system

This staged approach would enables the Council to spread the main costs over more years and gives it a chance to validate re-use in Akaroa before committing to large scale storage.

8.4 Long term

Once experience had built up with the system, then the decision could be taken on whether to retain the transitional harbour outfall to provide the overflow mechanism should the storage ponds became full. Should the storage become full during a prolonged wet period when demand is low, the overflow would continue until land uptake started again. The water may still contain a higher level of nutrients, including nitrogen, even with full removal, than would be healthy for a stream to absorb on a long-term basis. If a discharge over several weeks or months was needed to the harbour it would be rapidly diluted in the harbour and then flushed to the open ocean, with much less impact than releasing it to a stream and from there to the shallow bays of the coastal environment, impacting on recreational use and shellfish gathering.

8.5 Re-evaluated costings

The cost of providing beneficial re-use in Akaroa combined with a transitional harbour is made more economical through shared use of the purple pipeline already conveying the treated wastewater through the town to the parks and public toilets, and then extending it on land as possible through the town to either Greens Point or onto Takapūneke. The costings below reflect this. Note that they have also been adjusted to include the savings from the change to handling of bypass flows now included in the land-based options, as this saving appears to have been omitted in the consultation booklet costings for this option.

Table 2 Beneficial re-use in Akaroa plus harbour outfall costings

Description	Component	Cost
New mid-harbour outfall at Greens Point	Beneficial re-use in Akaroa	$3.5m
	CCC capital cost estimate in consultation document	$7.4m
	Saving from sharing the pipeline over land	-$3.0m
	Bypass removal	-$0.2m
	TOTAL	$7.7m
Re-use existing outfall	Beneficial re-use in Akaroa	$3.5m
	Continue pipeline to outfall	$1.0m
	Connection	$0.5m
	TOTAL	$5.0m

The more expensive of these alternatives for the beneficial re-use and a new transitional mid-harbour outfall is only slightly more than the $7.4 million needed for the harbour outfall starting at Childrens Bay proposed in the consultation document. Re-using the Takapūneke existing outfall is cheaper and could free a further $2.4 million for the initial purple pipe implementation budget. Savings have been made because of the cheaper cost of routing some of the harbour outfall pipe over land.

8.6 Harbour outfall as a standalone option

We are curious as to why the Council determined to start the underwater pipe run at Childrens Bay rather than taking it as far as possible by land to minimise the amount of more expensive underwater piping. If the pipe was run under land as far as possible, we suggest the base cost of the standalone harbour outfall proposed as Option 5 could fall from $7.4m to around $5.0m. However, as already stated, a stand-alone harbour outfall is not supported because it does not make beneficial use of the water and is offensive to Ngāi Tahu.

9 Residual flow to Pompeys Pillar for beneficial re-use

A second environmentally sustainable option for the residual flows in the interim is disposal to Pompeys Pillar, provided that the conditions below are met.

We submit the capital costs of the Pompeys Pillar option could be considerably lower than those presented in the consultation booklet if a *beneficial re-use* rather than *disposal* approach is taken.

We recognise that pumping the water over the hill may incur increased capital and operational costs compared with other options, but suggest that the principle benefit is the rapid establishment time enabling closure of the Takapuneke treatment plant and cessation of any harbour disposal as soon as the new plant is in place, in the shortest timeframe for any of the options. Potential additional benefits high altitude fire ponds and overflow to the open ocean rather than the harbour.

9.1 Conditions

9.1.1 Landowner agreement

There is only a single owner of the land required for the Pompeys Pillar option. Our support for Pompeys Pillar is predicated on the assumption that the landowner and Council reach a satisfactory agreement and that the landowner is genuinely a supportive and willing participant, and not threatened with compulsory purchase. We were concerned to learn during the early meetings of the Working Party that no such discussions had taken place, and pleased when they subsequently commenced. We understand they are ongoing during the consultation period and hope a suitable agreement can be reached before it closes. If not, we would withdraw support for this option. We have only included irrigation to pasture as an option as the landowners clearly articulated at the Working Party that trees would not be acceptable and they wish to continue pastoral farming.

9.1.2 Irrigation to pasture

Irrigation to pasture is a *beneficial re-use* because the wastewater is being put to productive use. Pasture irrigation could begin immediately on completion of construction. There is no need to wait for several years for trees to establish, or for shelter belts to grow, since irrigation could commence far from any boundaries. All the wastewater could therefore be put to productive use from the outset, provided there is sufficient land included in the scheme to support irrigation at the appropriate rate for grazing. The plant at Takapūneke and its associated harbour outfall could therefore be decommissioned as soon as the Pompey's Pillar irrigation is set up, and this would be potentially achievable by 2020 when the existing Takapūneke consent expires.

9.1.3 Extending the proposed area

We challenge the Council's assumption that much of the land identified as geo-technically suitable should be excluded on the grounds of the Outstanding Natural Landscape overlay and suggest that inclusion of these areas would *lessen* impact on the landscape and increase the potential for beneficial re-use rather than disposal.

Farming is a permitted activity in the Rural zone and Pompeys Pillar is currently subject to pastoral farming. The land, both inside and outside the Outstanding Natural Landscape zone, exhibits a variety of colours depending on the crops being grown or level of grazing. Adding irrigation to parts of the farm would be no different. The Outstanding Natural Landscape area of the farm property is only visible from that property or the open ocean. Disposal irrigation on the minimum area in the centre of the property as identified in the consultation document is likely to lead to an increase in visibility as this area will be a brighter green patch in the middle of the headland. Extending the area for watering to the entire 90ha identified as geotechnically suitable will result in lower levels of watering, and a similar patchwork of colours to that the property currently exhibits. The recent aerial imagery of Pompeys Pillar shows the patchwork of different colours as a result of farming activities, *including in the outstanding natural character overlay area*.

Figure 2 Pompeys Pillar showing Outstanding Natural Landscape overlay boundary. Areas on the coastal side of the line are within the overlay

9.1.4 Use of Pond Site 10

We assume that Pond Site 10 would be used for the principal storage since Pompeys Pillar is now an interim solution. We suggest that use of Pond Site 10 combined with re-use in Akaroa will reduce the amount of water to be pumped and therefore the costings of Pompeys Pillar in the combined option would be lower than those given in the consultation booklet based on its use as a standalone option. Pond Site 10 provides a large amount of buffering (as compared with proposals that did not include a pond at the plant) meaning that the wastewater only needs to be pumped to Pompeys Pillar at the average flow rate, not the maximum flow rate included in the current costings. The pumps and pipes do not need to be able to deal with peak flows and this may allow pump infrastructure to be reduced.

9.1.5 Fire ponds

We also see the potential to add much needed high level fire ponds as a side benefit of pumping water over the hill, and suggest that the capital cost of such ponds is sourced from another budget. The benefit of such ponds to this scheme is that they could be used as intermediaries enroute to Pompeys Pillar allowing the pipe run to be broken into stages and providing greater resilience. The incoming pipe would deliver water to the pond, the outgoing pipe take it away. The ponds would therefore remain full or near full at all times. They would not form part of the overall storage capacity. However, from a pond perspective, the stored water would be kept fresh and therefore minimise the risk of odour that could be likely with static fire ponds.

9.1.6 Cultural considerations

We are aware that Te Rūnanga o Koukourārata is carrying out a cultural assessment of the area. We note that no sites have been identified in the replacement Christchurch District Plan to which Ngāi

Tahu was a principal submitter. We are confident that should the cultural assessment indicate that there are specific areas of cultural significance, these would be either small areas or of relatively low significance and could be worked around given the greater benefit to Ngāi Tahu cultural concerns of the overall scheme obviating the need for a harbour discharge.

9.1.7 Potential to provide ocean outfall for overflows

As noted earlier, under the current options, ponds would overflow during a prolonged wet period to the nearest stream, leading to a direct mixing of waters without the wastewater having first passed through the land. This would apply anywhere that land disposal is proposed. The difference at Pompeys Pillar is that such streams flow to the open ocean rather than the harbour. It would be for Ngāi Tahu to establish whether this was preferable culturally to such mixed stream water flowing to Akaroa harbour. Potentially the overflow could be contained in a pipe taken over the cliff, so that no water mixing took place until the outer coast is reached.

9.2 Assessment against principles

An assessment against the principles is given in Appendix 2. Pompeys Pillar scores well on all counts provided that the landowner is agreeable to the proposals. We would particularly welcome the use of the water to improve the productivity of the farm and the involvement of the farmer in managing this optimally.

9.3 Short term implementation

All the residual water not used in Akaroa could be pumped to Pompeys Pillar and used on the farm, and provided that the area is sufficiently large, done so in a beneficial way.

Therefore, initial re-use in Akaroa as proposed in Option 4, combined with irrigation of the farm at Pompeys Pillar, could be implemented at once.

The Takapūneke plant and its associated outfall could be closed immediately, ceasing any further discharge of treated wastewater to Akaroa Harbour.

9.4 Long term

In the longer term usage of Pompeys Pillar would phase out as uptake from Akaroa increased.

Given the high sunk cost, it is likely that if this option were to proceed, the farm would need to guarantee to take the balance of the wastewater should wet weather limit up-take in Akaroa in perpetuity.

9.5 Re-evaluated costings

Given these assumptions and the potential benefits they bring, we urge the Council to re-evaluate the costings for Pompeys Pillar.

The costings for this option are based on the same assumptions as the other land disposal options, i.e.:

- Purchase of the required land, and
- Disposal to the minimum land area

Changing the approach from disposal to beneficial re-use by the existing landowner could alter both of these assumptions. Because the wastewater now becomes beneficial to the farming operation, there is no reason to believe the land would need to be purchased. Entering into other arrangements, such as leasing, is common in other schemes[14]. This would save the purchase cost, and the treated wastewater would confer a benefit upon the receiving farm as the water itself adds substantial value by increasing the pasture/feedstock growing season. The Council may need to underwrite the risk that in the future stock produced on this farm met with market resistance.

Because the land would continue to be farmed, the area irrigated does not need to be minimised. The entire area available (including coastal area) is potentially three times the minimum area identified by Beca as required. Using a larger area has the following advantages:

- Spreading the irrigation over a larger area would reduce the saturation level of the soil, allowing irrigation to continue for longer into wet weather, with a potential reduction in storage pond volume required.
- The original engineering study commissioned by the Council[1] recognised the difficulty of the Banks Peninsula soils and terrain, and recommended a "staged" approach whereby land disposal is initially carried out at a lower rate and monitored for several years, progressively increasing the rate if conditions allowed. However, by increasing the application area, the risks are immediately reduced, potentially obviating the need for staging irrigation, combined with re-use in Akaroa to further reduce the immediate water volume. This means the initial application rate could be as little as 25% of the design rate or less, giving the farm owner much greater flexibility over where and when the water is applied, making this a beneficial re-use solution, rather than disposal

The revised cost estimate for Pompeys Pillar, when combined with beneficial re-use in Akaroa, is:

Table 3 Beneficial re-use in Akaroa plus Pompeys Pillar costings

Component	Total cost
Beneficial re-use in Akaroa	$3.5m
Pompeys Pillar – estimate in consultation booklet	$13.7m
Revised estimate with land purchase cost removed on the basis of a beneficial re-use	$12.7
TOTAL	$16.2m

9.6 Consideration of Pompeys Pillar as a standalone option

Pompeys Pillar is the only land-disposal option presented that could stand alone as a beneficial re-use solution. If so, we believe it could be done at a reduced cost than that suggested in the consultation booklet. Nitrogen is a valuable resource for the farm provided it is not applied at an excessive rate. If the land area used included the entire 90ha, then this would allow a heavier nitrogen loading in the wastewater. The nitrogen retained in the wastewater would be used on the farm at an appropriate rate to grow more grass for grazing, rather than having it extracted at the plant. The lack of impacted waterways at the Pompeys Pillar site means this option would carry relatively low risk. Beca have advised that the Treatment plant could be "de-tuned" leaving more nitrogen in the effluent, with a potential saving of $2-3m[15]. The revised costing for the Pompeys Pillar option standalone would therefore be:

Table 4 Pompeys Pillar standalone option costing

Component	Total cost
Pompeys Pillar – estimate in consultation booklet	$13.7m
Revised estimate with land purchase cost removed on the basis of a beneficial re-use	$12.7m
WWTP de-tuning	-$2.0 - $3.0m
TOTAL	$9.7m - $10.7m

While we do not advocate this solution because it reduces the benefit obtained from the water compared with re-use in Akaroa, we would consider it to be an acceptable solution. We do not consider that ultrafiltration or disinfection would be required either if the water was only used for farming purposes.

10 Disposal based options

For clarity we now identify potential solutions based on the consultation options which are not supported. The fundamental criterion applied is:

Any proposal based around disposal, whether to the harbour or to land, is not supported as a solution because the precious resource of water is being wasted instead of used.

10.1 Disposal via harbour outfall

We see no harm to the environmental health of the harbour from disposal of highly treated wastewater via a harbour outfall, particularly if bypass flows are removed. However it completely wastes a scarce resource and makes no attempt to alleviate Ngāi Tahu's cultural concerns. Hence we have not proposed it as a suitable solution.

10.2 Land-based disposal

The remaining land based options in the consultation (irrigation to trees or pasture at Takamatua or Robinsons Bay) are also *disposal* options. They seek to use the minimum land area to dispose of the wastewater, rather than using when and where it is beneficial.

10.2.1 Spray irrigation

Spray irrigation to pasture in these areas might be presented as a beneficial use, but the high application rates and requirement to take the water are based on disposal rather than farming use thresholds. Given the large number of land owners involved it would be impractical to extend the irrigation over a greater area such as we propose for Pompeys Pillar. The limited areas proposed for irrigation would be too small to remove the nutrients through pastoral farming so they would need to be removed additional cost. Cut-and-carry management is normally practiced to export the nutrients that would otherwise accumulate in the soil. This would be impractical on much of the hilly slopes of the Takamatua and Robinsons Bay valleys, and only possible on the flat valley floors. Here it would impose the highest negative impact on amenity, both from the irrigation itself and the shelter belts proposed around these areas, and the number of multiple parcels make the economics highly questionable.

10.2.2 Trees are not beneficial use

Re-establishment of native forest is presented as a potential benefit of these solutions. While we welcome an increase in biodiversity, irrigation is not needed to achieve this and is likely to have negative effects on the resilience of native forest established under this regime.

Native forest regenerates rapidly on Banks Peninsula *without* additional watering as soon as stock pressure is removed. As demonstrated in the example below, native forest is re-establishing itself rapidly in Takamatua and Robinsons Bay wherever land is retired or lightly grazed.

Figure 3 Natural regeneration of native forest

Robinsons Bay c. 1980 Robinsons Bay c. 2017

The native forest that establishes naturally is inherently suited to its environment. Trees that establish naturally must put down strong and long roots in their search for water. By contrast introduced plants subject to intensive irrigation with water containing elevated nutrient levels are likely to be shallow rooted. They will be prone to blowing over in storms and more susceptible to fungal diseases due to a poorer root structure. We do not therefore class use of the water to establish native forest as a beneficial use, *particularly* when the plan is to do it on the smallest land area possible.

10.2.3 Land-based disposal poses an elevated risk

The disposal-based irrigation solutions presented in the consultation document seek to use the minimum amount of land feasible and maximise the application rate. They elevate the risk of ground water mounding and subsequent slips and flooding. We are concerned that **irrigation with the application rates proposed for disposal of water**, whether spray or drip, into any peninsula valley catchment would carry high risk because the peninsula soils and topology are so challenging. Intensive disposal elevates the potential for nitrogen leaching to streams, and increases risks of slips and flooding to downstream properties.

10.2.4 Inadequate buffer zones

The buffer zones proposed in the consultation booklet are wholly inadequate and the proximity of the irrigation and ponds to homes is out of line with other disposal schemes in New Zealand. Under the system proposed here, people could have trees grown within 5 metres of their house, blocking sun and views, or spray irrigation within 25m with attendant spray drift in windy weather, or alternatively large shelter belts creating issues with shading, blocking views and drastically altering the existing landscape character. The following table describes the actual distances to residences of other land treatment systems in New Zealand:

Table 5 Buffer distances elsewhere in New Zealand

Scheme	Type	Actual distance to residence
Wainui	Drip to trees	300m of existing mature pine forest stands between the irrigation area and nearest dwelling
Leeston	Spray	50m to boundary; 100m to nearest external dwelling; with mature shelter belts in place
Ashburton	Spray	500m to nearest external dwelling (farm paddocks in between); mature shelter belt
Rotorua	Spray to trees	At least 1km of forestry operation between sprayed areas and nearest dwelling

To add insult to injury, the buffers proposed around properties and homes suggested in the consultation booklet are smaller than those proposed around the outstanding natural landscape overlay at remote Pompeys Pillar.

10.2.5 Amenity and community impact

Rather than water being applied where it is wanted and welcomed, disposal into neighbouring valleys takes a problem from one community, and instead of solving it, imposes it on another. Residents of these neighbouring valleys already bear the cost and management of their own sewage disposal through the septic tank systems on their own properties, they would gain no benefits from these proposals. Instead they would now have the wastewater from another community foisted onto them with impacts on their amenity, livelihoods and property values.

These valleys are people's homes. The areas earmarked by the Council for ponds or irrigation are their gardens or the small, domestic paddocks around their homes. To state that the amenity values of the surrounding area are not significantly affected is fatuous. Should either of these proposals come to pass, the valleys of Robinsons Bay and Takamatua would be changed forever. Instead of being blessed with open views and sunlight, these areas could be covered by dense forest entirely surrounding homes to within 5 metres of property boundaries, or even imposed on people's own back yards, or subject to spraying as though they were desolate dairy paddocks.

The Takamatua and Robinsons Bay valleys are attractive areas to live, and contain flat, fertile land suited to smallholdings and agriculture. Converting these valleys to irrigation disposal areas is a waste of such useful and valuable land.

Should the Council apply for resource consent based on either of the valley disposal options, the Friends of Banks Peninsula would lodge a submission in opposition.

10.2.6 Upper Robinsons Bay

We have considered the option of disposal to upper Robinsons Bay. As discussed at the Working Party, this would be less objectionable from an amenity perspective than irrigation to the valley floor, particularly if there were mitigation and community compensation measures included to give the community reassurance against flooding and slips, enable public access to monitor activities and providing a public benefits. However, we consider there are too many unanswered technical questions and it carries too high a risk for it to be recommended as a land based option for the residual water flows at this stage.

As alluded to earlier, establishment of land based irrigation using native trees, as is proposed for upper Robinsons Bay, would take several years. The expert technical advice we have received is that this is such an experimental concept that it should be further staged to enable monitoring of the trees and the soil with a gradual introduction as actual conditions on the ground dictate**. This would**

not only absorb sunk cost over time, but would prolong the period before land uses, whether in Akaroa or upper Robinsons Bay could absorb all of the wastewater and replace the harbour outfall. The investment would be being made into a land-based disposal system at best in parallel to the installation of the purple pipe network in Akaroa, without conveying any benefit as it would not yet be able to take up the residual wastewater during the establishment period. This is the very time when the transitional uptake is most needed if harbour outfall is to cease. By the time the trees were ready to take the full amount of water, the Council could have been well on the way to having the beneficial re-use system established in Akaroa rather than a disposal system in Robinsons Bay that would eventually become defunct.

We have therefore assessed this option as carrying a significantly higher risk for considerably less benefit than our supported solutions.

11 Option development process

People are hugely concerned about the impacts on their cherished valleys and their individual property values, and shocked that the Council could even consider such solutions as forced irrigation around their homes. It does not make sense to involve multiple residential blocks in a compulsorily imposed wastewater disposal scheme.

Takamatua residents affected have lived with the stress of this for over a year; Robinsons Bay for over 6 months. Compulsory purchase has been threatened at every meeting, and the consultation booklet reaffirms this threat. A similar lack of respect has been shown toward the landowner of Pompeys Pillar.

That the options in the consultation document still include large storage ponds and disposal irrigation on private properties despite residents' concerns and the wishes of the Working Party continues the offence. It does nothing to build confidence in the Council or draw people to supporting the project – quite the opposite – it has the effect of driving a potential voluntary market away. The more the Council attempts to foist the water onto some people, the less it appeals to others and the more suspicion is generated.

The Council must work to turn this negativity around if any land disposal option involving large numbers of people is to be accepted. Friends of Banks Peninsula has participated in 10 community meetings since the proposals were first identified in October 2016 and at every meeting the public have stressed that **treating the water to the highest standard is key to acceptance of land based disposal anywhere around people and homes.**

12 Summary of options

The solutions supported in this submission are based on the adoption of non-potable re-use in Akaroa as the primary instrument to absorb Akaroa's wastewater whilst maximising environmental and community benefit. We have given two alternatives for the re-use or disposal of the remainder of the water while a reticulated purple-pipe system is gradually installed in the town. These: are to continue with a harbour outfall, using either a new pipe from Greens Point or the existing pipe at Takapūneke, or to send the water to Pompeys Pillar for use on the farm.

All are based on the conditions of:

- All water is fully treated, there are no bypass flows during heavy rain conditions.
- The water is treated to a standard suitable for watering salad crops. We have recommended ultrafiltration followed by disinfection such as chlorination.

- The outflow from the treatment plant is captured and tested before it is released to the main storage pond to enable re-treatment in case of sub-standard water being emitted.
- Maximum nitrogen removal is included at the plant.
- Principal storage is at Pond site 10.
- Council taking the lead in using the water to irrigate public areas in Akaroa, flush public toilets and install a demonstration garden including ornamental and edible plants.
- A commitment is made in the Long Term Plan and through consent conditions to install a purple pipe network through Akaroa over time, and Akaroa residents incentivised to use it.
- Water conservation measures are introduced into Akaroa.
- Stormwater infiltration work continues to reduce flows.

The following tables summarise both the solutions we have proposed and the solutions we do not support. We summarise the advantages and disadvantages of each, give the revised costings, and whether harbour outfall is discontinued and if so, over what timeframe.

Table 6 Summary of solutions supported

Option	Closure of Takapūneke	Harbour outfall	Cost in consultation	Estimated Revised Cost	Advantages and Disadvantages
Beneficial re-use + mid-harbour outfall	Immediate closure of treatment plant and its outfall	New harbour outfall constructed, but use diminishes to overflow only over time	$9.1m	$7.7m	**Advantages:** Low up-front cost option Provides best solution to overflow in prolonged wet periods Minimal environmental impacts Best option for long term resilience, retains a harbour outfall for emergency use **Disadvantages:** Does not immediately address Ngāi Tahu cultural concerns
Beneficial re-use + current (Takapūneke) outfall	Immediate closure of treatment plant, but retention of its outfall	Existing harbour outfall retained but use diminishes to overflow only over time	No comparable costings included in consultation document	$5.0m	**Advantages:** Lowest up-front cost, least investment in eventually redundant infrastructure Retains a harbour outfall for emergency use **Disadvantages:** Lower quality solution for residual flow and eventually overflow compared to mid-harbour outfall Does not immediately address Ngāi Tahu cultural concerns and retains some infrastructure at Takapūneke
Beneficial reuse + Pompeys Pillar	Immediate closure of treatment plant and its outfall	No	$15.4m	$16.2m	**Advantages:** Allows immediate start, with all wastewater being used beneficially from the outset. Addresses Ngāi Tahu cultural concerns Immediately removes all treated wastewater from Akaroa Harbour Could provide optional extras such as high level fire ponds and overflow to ocean in prolonged wet periods **Disadvantages:** High sunk cost reduces the incentive to re-use all of the wastewater in Akaroa over time

Table 2 Summary of solutions not supported

Option	Closure of Takapūneke	Harbour outfall	Cost in consultation	Estimated Revised Cost	Advantages and Disadvantages
Pompeys Pillar - standalone	Immediate closure of treatment plant and its outfall	No	$13.7m	$9.7m-$10.7m	**Advantages** Immediately removes all treated wastewater flows from Akaroa Harbour Beneficial use for farming Could provide optional extras such as high level fire ponds and overflow to ocean in prolonged wet periods **Disadvantages** Does not address Akaroa's water shortages, benefits of re-use are not maximised More expensive
Mid-harbour outfall	Immediate closure of treatment plant and its outfall	Yes – in perpetuity for all flows	$7.4m	$5.0m	**Advantages** Least expensive option Minimal environmental and amenity impact **Disadvantages** Does not make any use of the water Does not meet Ngāi Tahu's cultural concerns
Beneficial re-use in Akaroa + Upper Robinsons Bay	Takapuneke retained until all flows can be absorbed by Akaroa or trees at Upper Robinsons	Retained until trees established in Robinsons Bay – at least 5-6 years. More if a prudent staged approach is taken	$8.3m	$10.6m	**Advantages** Single willing seller **Disadvantages** Long implementation time while trees establish. Takapuneke treatment plant and harbour outfall retained during this period High risk – irrigation to native trees is not used elsewhere Elevated risk of flooding, slips and nitrogen leaching to Robinsons stream Investment in tree establishment and irrigation at Robinsons Bay reduces the incentive to re-use the wastewater in Akaroa. Relatively high sunk cost once all water being re-used in Akaroa. Overflow during prolonged wet periods once harbour outfall ceases would be to either Grehan Stream or Robinsons stream

Option	Closure of Takapūneke	Harbour outfall	Cost in consultation	Estimated Revised Cost	Advantages and Disadvantages
Takamatua or Lower Robinsons Bay valley floor	Takapūneke retained until all flows can be absorbed by trees in these valleys or shelter belts established	Retained a minimum of 5-6 years for native tree or shelter belt establishment and preferably considerably longer for a staged approach as recommended	$6.6m-$8.4m	$8.4m-$10.2m	**Advantages** None **Disadvantages** Multiple land parcels required. Lack of willing sellers and community resistance Severe amenity effects on residents in the valley from surrounding in forest or cut-and-carry operations Longer implementation time; Takapūneke plant and harbour outfall needed until native trees or shelter belts established No beneficial use of the water;- disposal only. Does not address Akaroa's water shortages Highest risk of flooding and nutrient leaching Overflow during prolonged wet periods would be to valley stream (and then to harbour)
Upper Robinsons Bay - standalone	Takapūneke retained until all flows can be absorbed by trees	Delayed by a minimum of 5-6 years for tree establishment. More if a prudent staged approach is taken	$6.6m	$8.4m	**Advantages** Single willing seller Potential less amenity impact than Valley floor options provided appropriately developed **Disadvantages** Long implementation time while trees establish. Takapūneke treatment plant and harbour outfall retained during this period High risk – irrigation to native trees is not used elsewhere Elevated risk of flooding, slips and nitrogen leaching to Robinsons stream Overflow during prolonged wet periods would be to either Grehan Stream or Robinsons Bay stream

13 Conclusion

Communities have been shocked by the proposals produced by Council and the way in which the process has been conducted to date. Friends of Banks Peninsula has worked hard to listen to these communities and to find a way forward that deals with their concerns and their desire to see the Akaroa wastewater treated to the highest possible quality so that it can be put to beneficial use where it is most needed.

We respect and acknowledge the work of the Banks Peninsula Community Board in recognising the seriousness of the issue and setting up the Working Party, and we commend the able chairmanship provided by Penny Carnaby. This submission builds on the progress made by the Working Party through listening to community and Ngāi Tahu concerns in a respectful and constructive way and in treating community input and local skills and knowledge as something to be harnessed. As a result of that progress made, beneficial re-use of the water in Akaroa has been included in the consultation.

The solutions we have proposed are based on Option 4 - Non-potable re-use in Akaroa. They are aimed at maximising long term benefit, minimising risk, and providing Akaroa with the greatest resilience long term to balance the challenge of the dwindling water supply predicted by the change to a drier climate with increased demand from a growing population.

Beneficial non-potable re-use is still uncommon in New Zealand, but it is widely practiced overseas and the technology to treat the water to a sufficiently high standard and deliver it to businesses and residences with a purple pipe network is mature. In contrast, intensive land disposal has a recent and chequered history in New Zealand and, given the unique challenges posed by Banks Peninsula's topography and poorly draining loess soils, we believe this to be a much riskier option, that does not deliver the long-term benefits of recycling the water in Akaroa.

We have taken into account that the root of all proposals is to reduce the offence to Ngāi Tahu caused by the existing treatment plant at the culturally significant site of Takapūneke and to withdraw from the culturally offensive practice of mixing water that has passed through humans into the harbour without first passing through land.

Our preferred solution is to combine the Non-potable re-use in Akaroa with transitional harbour outfall. We believe this will lead to the best environmental outcome in the long term. It comes with a lower price tag, and much less capital sunk up-front in a residual disposal that will gradually become redundant for regular use. We recommend that the outfall is retained to provide the most environmentally sound way of dealing with overflow should a prolonged sequence of wet weather temporarily preclude land based use.

However, we recognise that this will necessitate the culturally offensive practice of mixing waters to continue not only for a longer period during implementation but also in the long term for emergency use. Hence we have also included a solution with beneficial re-use at the remote farm of Pompeys Pillar. This solution would enable the harbour outfall to be discontinued immediately upon implementation, but has a higher up-front and overall cost, and therefore a greater financial disincentive to phase in additional purple pipe reticulation in Akaroa. Emergency overflow would be to streams, or potentially to the ocean. These factors combined mean it may be of higher cultural but lower environmental benefit in the end.

We have also identified the solutions that are not acceptable. These are based on the disposal rather than the beneficial re-use of the water, have high impacts on the communities neighbouring Akaroa and a long implementation period during which both the treatment plant at Takapūneke and its harbour outfall would be retained. Should the Council continue to progress solutions that are

environmentally and socially unacceptable to the resource consent stage, we signal that we would submit in opposition and fully participate in the process.

We implore the Council to select a solution that has community support and make better use of public money through building Akaroa's resilience based on a co-operative approach rather than on legal expenses fighting its own ratepayers. We implore the Council to further investigate the implications of Option 4 – Non-potable re-use in Akaroa, as it has only been introduced to the consultation mix near the end of the research and design process, and to now examine how it could be staged in and costed effectively through the Council's long term plan in conjunction with any resource consent application based upon it.

If the Council selects a solution based on beneficial re-use in Akaroa and with a residual disposal method that is acceptable to Friends of Banks Peninsula, we would expect to further engage in a constructive manner to ensure that solution provided an exemplar for communities elsewhere in New Zealand or even overseas. We trust that the Council finds this submission constructive and helpful in assisting it to determine the next stage of the Akaroa Wastewater process.

We believe that Akaroa is now positioned to lead New Zealand with a beneficial re-use system that would best position it to face the challenges of climate change ahead, improve the health of its streams and potentially end summer water restrictions in the town. We urge Christchurch City Council to demonstrate that it treats its water resources and its communities, both tangata whenua and pākehā, with the greatest of respect and projects a 100% Pure image at its top tourist town.

Appendix 1 Expert advice EcoEng

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Ecological water and wastewater engineering

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Memorandum

6 April 2017

To: Friends of Banks Peninsula
From: Andrew Dakers
Subject: Akaroa Wastewater Land Application Proposal

Attention Sue

This letter is in response to a letter from members of Robinsons Bay community requesting statement from me on the risks of year round land based wastewater application on the Banks Peninsula.

Banks Peninsula soils, topography, geology, land use and catchment configurations make large scale year-round wastewater land application of treated domestic wastewater, very technically challenging, with potential for high risks with respect to:

- Public, and private health
- Land and water based ecosystem integrity,
- Cultural and social values of the local affected communities and individual land owners
- Affected land values
  and
- Unacceptable economic burden to present and future rate payers.

My reasoning for stating the above follows.

- The upper soils are generally poorly draining loess soils, often with compacted pans and other anomalies that further restrict the vertical movement of applied water. These soils overlay bed rock. (Note: The Pattle Delamor Partners soils reports have noted significant shallow red and grey mottling at relatively shallow depths, indicating significant seasonally saturated soils over many years).
- The topography is highly variable, steep in parts, with geological structures giving rise to slope stability risks, both in terms of mass earth movement and shallow erosion (some areas of dispersive soils).
- Within the Akaroa Harbour catchment there are many surface streams and water courses draining into the harbour. Some of these steams and receiving harbour bays are used for recreational purposes as well as supporting biodiversity and are potentially at risk.

The above factors make both large scale year round irrigation of treated wastewater and provision of large affordable storage facilities significantly more challenging than many other sites.

This does not mean that treated wastewater cannot not be safely applied to Banks Peninsula land areas at certain times in the year without significant risk. It does mean that should such a proposal be adopted it would be wise to proceed with caution, careful monitoring and in sensible stages, perhaps over many years to provide knowledge for the unknowns referred to later. **The ultimate goal may be to achieve year-round**

land application of all treated wastewater from the new Akaroa WWTP. I know of no other similar year-round large scale wastewater land application system in NZ on similar soils and topography that has been operating successfully for a substantive period at design load. This proposal is essentially a first for NZ.

The latest consultation document, CIT0630 Final 2, lists 5 options:

1. Irrigation of trees or pasture at Robinsons Bay
2. Irrigation of trees or pasture at Pompeys Pillar
3. Irrigation of trees or pasture at Takamatua Valley in combination with another area
4. Non-potable reuse in Akaroa in combination with another option
5. Disposal via a new outfall pipeline to the mid-harbour

The same draft document made it clear that Options 1,2 and 3 are to be year-round irrigation to land. The consultation document does not seek submissions any options that are a combination of land application and harbour discharge, even as a staged development option.

A staged combined land/harbour discharge option, after full scale advanced treatment, is likely to result in an immediate and significant step towards long term protection of the harbour ecosystem, with minimal risk to land based ecosystems (and embedded human communities) both in terms of ecological sciences, harbour water quality and protecting and enhancing the mauri (life force) of the harbour. This may not fully satisfy the immediate expectations of Ngāi Tahu, but it likely to be the most pragmatic and optimal compromise that will enable life to resume for Banks Peninsula residents with minimal cultural, public health and environmental risks and without unacceptable economic burden to affected rate payers. Furthermore, a staged combined land/harbour discharge option will require significantly less storage.

What do I mean by staged combined land/harbour discharge option?

a. Install the new advanced treatment plant essentially as consented (i.e. a new full capacity treatment plant)
b. Upgrade Akaroa sewer network over an acceptable time period to achieve significant reductions in I&I
c. Install land application for summer period when soils and vegetation is most receptive to the application of treated wastewater to land and discharge to the harbour for periods when land and vegetation is not receptive to land application.
d. Allow appropriate harbour discharge, perhaps via a low cost wetland or infiltration gallery, for times when the land is not safely receptive to land application
e. Implement (c) and (d) in stages to increase discharge to land and reduce discharge to the harbour over time as knowledge with respect to safe land application is gained.

It is acknowledged that a previous consultation document noted that *options involving a coastal infiltration gallery located at the end of the Takamatua Peninsula ….* were not acceptable to Ngāi Tahu.

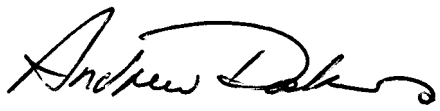
The staged combined land/harbour discharge option would seem to me to be an eminently sensible compromise, given the current high degree of uncertainty and risk for the year-round irrigation option.

<u>In summary</u>, the reasons I believe an option of (staged) combined land/harbour discharge post advanced treatment should be considered more seriously are:

- Banks Peninsula soils, topography/geology, land use, catchment configurations and settlement structures make year round irrigation of treated wastewater a high geotech, public health, environmental, social/cultural and economic risk. There is no similar long-standing large scale year-round land based wastewater irrigation system in NZ to model options 1 to 3 by.

- There are a number significant technical knowledge gaps. Staged development of combined land/harbour discharge option will provide not only more time but also feedback monitoring data. The current knowledge gaps include:
    - The actual (rather than theoretical) site specific down slope risk in relation to different hydraulic loading rates
    - The site specific effect of tree roots on slope stability
    - Once a specific site has been chosen a more detailed site specific water balance modeling may be required – to take into account additional input variables such interflow, and output variables such as deep percolation (LTAR), evapotranspiration, interception, and maybe other factors. At the moment modeling variables are unrefined due to sparse specific field data and lack of local specifics and knowledge.
    - Long term site specific nutrient uptake coefficients (especially for trees) and nutrient pathways for Banks Peninsula soils require refining and modeling.
    - Climate change science continues to be improving and likely impacts (especially extreme events) becoming more predictable.

Yours faithfully



Andrew Dakers
Director and Principal Engineer

Appendix 2 Assessment of options against Community Strategy Principles

Each of the Acceptable Options is assessed against the relevant Principles in the Community Strategy. (Excludes A,E and H assessed in the main text as apply to all options)

2.1 Option 4 Non-potable re-use in Akaroa

Principle B - Disposal must be in the right area, not one that externalises risks and costs onto adjoining residents, or destroys the amenity or health of the environment

We consider that if the Council is prepared to take a lead and irrigate the water into the public reserves, a demonstration garden and the public toilets, then our concerns about risks to health would be addressed.

However, we have some doubt as to whether the areas suggested for watering in the consultation booklet are sensible. The reserves discussed for the watering at the Working Party were Akaroa's waterfront reserves, the Recreation Ground, the area near Daly's wharf, the grassy area adjacent to the main beach and the Britomart Reserve near the main wharf. All these areas are adjacent to public toilets and all are suffering from heavy over-use and looking very dry and tired. All these areas are flat and incur heavy usage, and we had assumed watering would be done with underground piping in the smaller reserves as is usual on golf courses.

The Consultation document however now describes irrigating L'Aube Hill and Stanley Park and we do have concerns about both of these. L'Aube Hill is steep, and mainly forested with Kanuka, a species as already described that does not like wet feet. We would therefore be interested to see the watering level proposed for this reserve before being reassured that it would be suitable both geotechnically and for the plants. There is significant infrastructure below the reserve including St Patrick's church.

Stanley Park may be intrinsically more suitable for irrigation as it is currently largely pasture, maintained by grazing and mowing, although there are also stands of kanuka. Stanley Park has a Reserve Management Committee, and we trust that their views have been sought before putting this concept into the public domain. Irrigation will cause greater grass growth and this may cause management issues or require a higher stock level.

We would be sympathetic if neighbours to Pond Site 10 were concerned, but note that it appears to be 225m from the nearest residential unit (the uppermost of Akaroa Cottages) from which it is very well screened by vegetation on both sides of State Highway 75

Principle C-Solution must be sustainable in the long term and robust in the event of natural disasters

We consider that a solution based on re-use of the water in Akaroa township makes a substantial contribution toward the sustainability of the town by reducing its demand for potable water.

Option 4 makes a start on this, and a promise of more to come in the future…..

The Pond at site 10 would need to be engineered to the highest standard. We would expect the Council to hold liability insurance to cover any eventuality such as collapse and any impact on neighbours below – principally the Akaroa Cottages

Principle D - Solution must meet Ngāi Tahu cultural values

We understand from Ngāi Tahu members of the Working Party that reuse in Akaroa is acceptable to them.

We are also aware that re-use carries with it the chance that water used for outdoor purposes could make its way to a stream and then the harbour without passing through land. We suggest a pragmatic approach is taken to this. Where possible, such as at the main boat-wash, such water will be captured and sent to the Treatment Plant. Otherwise it will make its way to the streams as do many other contaminants from urban environments. Measures such a riparian planting should be encouraged along waterways to minimise and mitigate all forms of run-off, and we suggest that the Council work with the Zone Committee and others to carry out this planting along all the streams, prioritising those at risk of treated water run-off.

Principle E - Managed process and infrastructure

Further information needs to be provided, and Friends of Banks Peninsula is happy to contribute to the design and implementation.

Principle F - Ideally find a solution that makes beneficial use of the water

The consultation identifies that Option 4 is the start of plans to create a purple pipe network throughout Akaroa. Data presented by Council and the final Working Party meeting suggested that it would be possible for 100% of the water to be re-used in Akaroa, and the Working Party agreed that re-use in Akaroa is desirable. We consider re-use in Akaroa would be the most beneficial as this is where it is most needed.

Principle G - Obviate the need for compulsory purchase

Re-use in Akaroa would be entirely voluntary on private property, and we assume that the Council's calculations behind the 25% use in reserves and public toilets was based on a beneficial level of watering.

No compulsory purchase would be needed for this option.

2.2 Pompeys Pillar residual solution

Principle B - Disposal must be in the right area, not one that externalises risks and costs onto adjoining residents, or destroys the amenity or health of the environment

Our support for Pompeys Pillar is based on the Council reaching a contractual agreement with the landowners that they are happy with, with no threat of compulsory purchase.

Principle C-Solution must be sustainable in the long term and robust in the event of natural disasters

Pompeys Pillar scores less well on this, in that there are pumping costs, and one member of the Working Party was concerned that the long pipe would be more vulnerable in the event of a natural disaster. We agree with this, but note that if the end intention is to develop 100% re-use in Akaroa over time, then perhaps of more importance is to consider what value would be left in the residual infrastructure once irrigation at Pompeys Pillar ceased. Could it, for example, provide an outlet in the event of a succession for wet seasons?

Principle D - Solution must meet Ngāi Tahu cultural values

We understand from Ngāi Tahu members of the Working Party that re-use in Pompeys Pillar is acceptable to them, subject to the findings of the cultural assessment.

Principle E - Managed process and infrastructure

An advantage of this system would be if the farming family managed the infrastructure at the Pompeys Pillar end, and particularly if the area of the farm used and pond storage was sufficient that they could manage the water to maximise its beneficial use and minimise the need for disposal.

Principle F - Ideally find a solution that makes beneficial use of the water

The water and nutrients it contains would be used to improve the productivity of the farm. This should be taken into account in the whole of life costings, and a fair deal struck from both sides.

Principle G - Obviate the need for compulsory purchase

We would not support this option if it relies on compulsory purchase for the property.

2.3 Harbour outfall residual solution

Principle B - Disposal must be in the right area, not one that externalises risks and costs onto adjoining residents, or destroys the amenity or health of the environment

The water quality emitting from the treatment plant would now be a considerably higher quality than that proposed in the original application for harbour discharge, because the bypass flows are captured and a very high standard required for the purple pipe re-use in Akaroa. We note that the risk to shellfish identified earlier was largely due to bypass flows. If the water was suitable to irrigate salad crops that are directly watered, we cannot see that it can have an effect on shellfish when it has been much further diluted in the harbour.

Water disposed to the centre of the harbour would be rapidly diluted by the receiving environment and flushed out with the tide. The area proposed is well-away from swimming beaches and on the ocean floor.

Principle C-Solution must be sustainable in the long term and robust in the event of natural disasters

A harbour outfall properly installed would be robust and resilient. The sustainability criteria would be met if Harbour outfall was part of a re-use package and may provide the safest and most sustainable way to deal with overflow in the event of several wet seasons overwhelming the pond capacity.

Principle D - Solution must meet Ngāi Tahu cultural values

Harbour outfall does not meet the Ngāi Tahu cultural values, but we ask for consideration as to whether it is acceptable as an interim measure.

Principle E - Managed process and infrastructure

Probably easily managed. CCC has experience of harbour outfall already, Bromley has ocean outfall.

Principle F - Ideally find a solution that makes beneficial use of the water

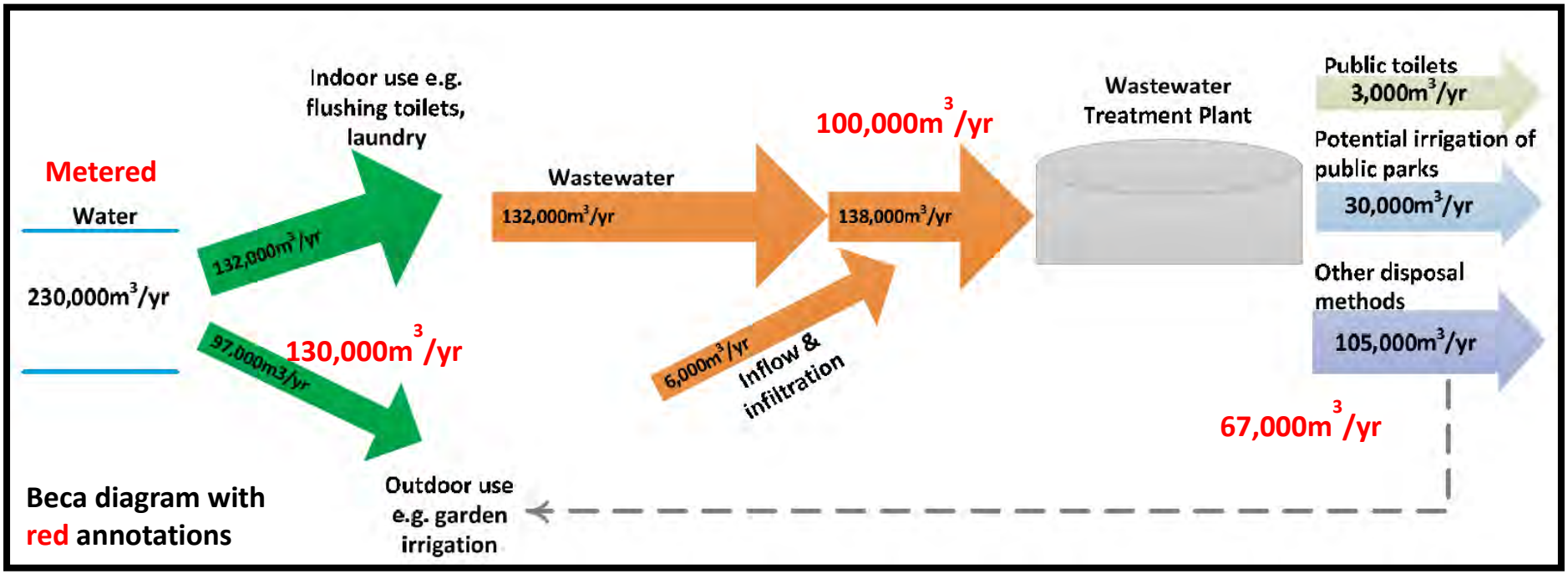
Harbour disposal does not make beneficial use.

Principle G - Obviate the need for compulsory purchase

No compulsory purchase involved.

Appendix 3 Calculating re-use potential

The following diagram is supplied in the Beca report. It gives metered water volumes based on the current flows but wastewater flows based on 2041 projects. Our annotations in red give the current flows.



- Municipal re-use identified in the Beca report is 33,000m^3. This is 25% of 2041 wastewater design flows and 40% of 2015 actual flows.
- A significant proportion of Akaroa's potable water is used outside by households, chiefly garden watering, as identified in a 2003 Lincoln study[18] and more recently calculated by Council staff at 97,000m^3 [15].
- The calculation is made by comparing the total amount of potable water flowing into properties as measured by water meters, and the total amount of wastewater arriving at the treatment plant, less an estimate of stormwater infiltration. The difference is essentially water people have taken through their metered supply but not put down the sewer – i.e. used externally for activities such as garden watering or washing cars.
- The 97,000m^3, combined with municipal demand of 33,000m^3, gives a total demand of 130,000m^3, which easily exceeds both the 2015 and 2016 wastewater annual flows of 79,000m^3 and 76,000m^3 respectively, and almost meets the 2041 design flow of 138,000m^3. Using the maximum current flows from the past

five years (rather than projected flows), this external use may in fact be as high as 130,000m^3 which, combined with the municipal demand gives 163,000m^3, and would easily use all of the supply.

- The demand for garden watering is currently "throttled" every year by water restrictions; there would be no such restrictions on the "purple water" so private demand could be significantly higher.
- From this we infer that demand for non-potable re-use is likely to be enough to meet the entire wastewater flows anticipated by 2041.

Appendix 4 Technical matters outstanding

We draw attention to the many matters where technical information is still outstanding.

4.1 Knowledge gaps

Beca identified gaps

In their latest report[15], Beca acknowledge the following areas as requiring further investigation, and as potential sources of risk. These statements support the view that there are still fundamental knowledge gaps and uncertainties around the long-term effects and risks from the anticipated hydraulic and nutrient loads, as well as other aspects:

- The need for agricultural soil tests to determine current nutrient state and appropriate measures to maximise growth of trees or pasture to maximise nutrient and water uptake, i.e. both the water and nutrient uptake aren't accurately known. (p8)
- Storage volume remains indicative (p9)
- Risk of midge nuisance is currently unknown (p36)
- Uncertainty around WWTP effluent quality parameters because the final WWTP solution has not been selected (p37). Further, Beca indicate the difference between design and actual performance and that the design parameters represent a "worst case". However, for nitrogen removal their example (Motueka) performs *worse* in practice than the design value (24g/m3 vs 20). (p38)
- Potential for localised erosion points where groundwater exits the ground such as banks of water courses and other slopes (p49). Bank collapse is a flood risk for areas with residences downstream such as Robinsons Bay and Takamatua. For 11 Sawmill Rd, risk of local river bank instability identified, and movement of silt slopes may be expected to occur following heavy rain or seismic activity (p50). (Frequency and intensity of high rainfall events is predicted to increase with climate change.)
- Long-term-acceptance rate (LTAR) and nutrient uptake still needs to be determined (page 50)
- Higher risk of drainage to groundwater in Robinsons Bay and Takamatua acknowledged but not quantified (p65)
- Further work required (p78)
    - Completion of Overseer analysis of potential nitrogen leaching for each scheme option
    - Completion of the soil water balance for irrigation to trees as recommended by the Technical Experts Group.

Additional issues found in the Beca report

In addition to the issues raised by Beca in their report (March 2017), there are other statements made that require a closer analysis:

- Re restoring the *mauri* of the water by elimination of wastewater (page 1): the land-based treatment options all require an "overflow" for when the ponds are full and irrigation is unable to proceed. With the exception of Pompeys Pillar, where this overflow would be discharged to the open ocean (via the nearest stream valley), the overflow would enter the harbour at its head, and would therefore have the maximum impact on the *mauri* of the harbour. In contrast, a mid-harbour discharge places the wastewater further down the harbour and in deeper water, where it is rapidly flushed out to sea on the outgoing tide. From an environmental and public health point of view, discharging wastewater containing nutrients and other contaminants into the shallow harbour bays will have the effect of concentrating those nutrients and contaminants in the silt on the bottom, as is thought to be the case from the Duvauchelle outfall, which affects Robinsons Bay[16]. This is also true of any nutrients and contaminants that leach from the disposal areas into local streams.

- 25m buffers to streams and the coast to minimise nutrient leaching (page 12): almost all of the proposed irrigation areas are on hillslopes, so both leaching and runoff would be expected to flow downhill to the nearest waterway. A 25m buffer is unlikely to be sufficient. We note that additional buffering does not appear to have ever been considered as a remedy to nitrogen leaching at Whakarewarewa.
- Duvauchelle golf course was excluded because it is earmarked for Duvauchelle's water (page 18). The golf course is approximately 40ha of trees and lawn, most of which appears to meet slope requirements. Since the population serviced by Duvauchelle is much smaller than Akaroa it is possible the golf course could use the water from both via sub-surface irrigation. There is also another 10ha of farmland directly behind the golf course of suitable slope with the majority of this at a considerable distance from dwellings, should expansion be required. The golf course is public land, and the cost of the extra pipeline would be offset by saving on land purchase.
- Nitrogen load calculation of less than 70kg/ha (page 20): the design median nitrogen concentration is 20g/m3; at 138,000m3 per annum over 27 ha this equates to 102kg/ha, and 114kg/ha for 25 ha (trees).
- Tonkin and Taylor slope hazard susceptibility maps were used to exclude erosion zones (page 22), but these do not cover all of the area identified for Robinsons Bay. The areas that are mapped show significant local instability on land similar to the unmapped areas proposed (e.g. on the 11 Sawmill Rd property). This suggests further geotechnical assessment is still required, and that the same visual assessment used by Tonkin and Taylor would likely identify areas of local instability on this additional land.
- High Natural Character and Outstanding Natural Landscape areas (page 22): excluding these areas for irrigation to pasture makes no sense when the proposed activity has the same visual amenity effects as farm irrigation (which is a permitted activity), and the area is already visually modified by farming activities in the overlay areas. There is also no justification given for the 50m setback. Pompeys Pillar land available is closer to 90 ha if these areas are included.
- BOD load for the pond (page 35): an upper limit of 30-40kg/ha/day is recommended, but then the higher value of 40 is selected. If the more conservative value of 30kg/ha/day is selected, Beca's modelling shows this being regularly exceeded. Given the speculative nature of the modelling, the risk of odour cannot therefore be said with certainty to be low.
- Pond risks (page 36): no thought given to wildlife fouling the water, e.g. Canada geese, as has happened for large ponds in other parts of Canterbury such as Oxford. The pond will be a stagnant water body over winter, increasing the risk of odour and nitrogen build-up from bird faeces.
- Reverse Osmosis (page 41): the report suggests it has no use but does not consider its part in beneficial re-use in Akaroa. Under a combined re-use and land disposal solution the RO plant could be located in Akaroa. The retentate (a much lower volume – potentially 10-15%) could then be disposed of on land giving a much lower water application rate (land area may still need to be large to take the nutrient and contaminant load), making a lot more areas viable because the instability risk would be negligible. Also, RO is not simply an additional cost: if used the WWTP would be re-configured to suit. Also, RO removes nitrogen so further nitrogen removal may not be required, depending on where the retentate would be disposed of.
- Robinsons Bay BH1 near the coast (page 52): this shows shallow groundwater that is tidally influenced, making it probably unsuitable.

Technical Working Group

The second Joint Statement issued by the Technical Working Group confirms several of the knowledge gaps, including:

- Review of LTAR required (3.2)
- Soil scientist to review assumptions, may require further soil testing (3.4)
- Appropriateness of buffers assessment for site-specific risks needed (4.3)

- Groundwater movement not fully investigated and requires further monitoring to determine risk of nitrogen leaching (4.5)
- Impact of climate change on rainfall patterns and associated storage requirements (4.7)

4.2 Unanswered Working Party questions

The Working Party raised questions various aspects of the proposed solutions, which were directed to the Technical Working Group. The following questions remain unsatisfactorily answered:

- What application rate would result in no ground water mounding?
- What slope would be safe if lower water levels (e.g. half that currently proposed) were to be used? What would be safe if there is already well-established bush on the slopes?
- An assessment of soil nitrogen issues taking into account the poor experiences at other land disposal places such as Rotorua, Leeston and Selwyn Huts. How is nitrogen saturation to be avoided in a Peninsula land disposal?
- Investigate the assertion that the Medical officer of health would not allow wastewater to be irrigated behind Akaroa. We have seen no evidence from drinking water standards that this could not be done provided the water collected was then properly treated and/or applied sufficiently far from water intakes. It is our understanding that the assertion relates to returning the treated wastewater to the Akaroa drinking water catchment, which does not preclude using or disposing of it in areas that don't impact on the town drinking water supply.
- Technical group to investigate and give serious consideration to the concept of a distributed network introduced in stages.

4.3 Inadequate data

The investigations undertaken to date have been carried out over a short time frame that limits the data collected. Further, there are issues with the type and quality of data gathered:

- Soil sampling and infiltration testing has been carried out over a single summer only. Soil moisture levels influence infiltration rate, and these vary significantly with the seasons, as observed between September and January during the investigations. The infiltration rate for the rest of the year has not been established.
- Core samples taken during investigation often contained "no recovery" gaps (Beca report Appendix M). In one case (BH2 – Robinsons Bay valley), more than 1m of the core sample was missing, and BH6 (Takamatua upper valley) has two major missing sections of 0.77m and 0.6m.
- A Lincoln University investigation into irrigating native tree species will have been running for less than two years when it reports to this investigation. This is insufficient to determine long-term effects on both the trees and the receiving environment. Further, the juvenile trees are planted closely together in rows with grass in between, which does not reflect either the planting pattern that will be used or the long-term conditions; in particular, the on nutrient uptake of the (mowed) grass will dwarf that of the young trees (confirmed in an email from Brett Robinson)
- A Lincoln University investigation into the application of wastewater to pasture is using lysimeters to measure nutrient uptake in pasture. This is not an accurate reflection of what will occur *in situ*, and will not accurately reflect the effect of the build-up of nutrients and contaminants in the soil because the soil samples are being allowed to freely drain rather than build up (high) moisture content levels. No information has yet been released regarding the direct measurement of nitrogen build-up in the soil.

4.4 Nitrogen removal requirements

- If irrigation to pasture at Pompeys Pillar is used, over a 27ha area as proposed, then the proposed nitrogen level emitting from the plant is appropriate,, giving an average annual load of 102kg/ha, with no at risk water bodies present. However, if all of the land identified as geotechnically suitable

were to included, this would more than triple the land available for irrigation, enabling a much lower application rate. We calculate that at this rate of application the WWTP could be "de-tuned" because the higher nitrogen concentration (a maximum of 60g/m^3) spread over the larger area equates to the same per-hectare load. The cost saving identified by Beca would be $2-$3 million it this additional land was included and the plant de-tuned[15].

- For irrigation to either trees or pasture in Robinsons Bay and Takamatua, there is risk of nitrogen leaching from the irrigated area into shallow groundwater and streams. We note that the nitrogen load per hectare planned would be similar to that applied at Whakarewarewa, which saturated the soil with nitrogen over the first five years, and has been leaching out to the local waterway ever since. For these options it would therefore be prudent to apply the full nitrogen removal.
- For beneficial re-use in Akaroa, it would be prudent to apply the full nitrogen removal to minimise the risk of nitrogen saturation and leaching
- For harbour outfall, we assume the proposed level is acceptable given the rapid dilution that occurs. We have no opinion on whether "de-tuning" would be appropriate, however we note that water flowing to the harbour from the existing Takapūneke treatment plant has a higher nitrogen concentration than that proposed (approximately 28g/m3 compared to 20g/m^3 for the proposed plant), and there have been no reported environmental effects as a result[17].
- Hence we suggest the costings of the options listed in the Consultation booklet should be adjusted as follows to achieve the optimal cost/benefit for nitrogen loading.

Option	Variation	Cost impact
Pompeys Pillar (pasture)	De-tune WWTP	-$2-3m
Robinsons Bay/Takamatua (trees or pasture)	Full nitrogen removal	+$1.8m
Beneficial re-use in Akaroa	Full nitrogen removal	+1.8m
Harbour outfall	No change	$0

4.5 EcoEng review advocates caution

Andrew Dakers from EcoEng has been involved in the process for many years, most recently as a member of the Technical Working Group. He has advised Friends of Banks Peninsula that in his opinion caution is required before implement a "first for New Zealand" on the difficult topography of Banks Peninsula. He identifies substantial knowledge gaps, including:

- Site-specific down slope risk in relation to hydraulic loading rate
- Site-specific effect of tree roots on slope stability
- Detailed site-specific water balance modelling
- Long-term site-specific nutrient uptake coefficients and nutrient pathways
- Climate change likely impacts (especially extreme events)

4.6 The need for a peer review

The issues raised in this section highlight the need for the information produced to date to be peer reviewed to assess the details, risks, and overall suitability of approach. Whilst we are sure the parties involved to-date are acting professionally, nonetheless they have a history of involvement with large sewage treatment and disposal projects that may be unconsciously directing how the investigation has proceeded. Peer review by an independent party with appropriate expertise but from outside the sewage treatment and disposal field is recommended to identify where the investigation may have missed opportunities and risks.

Appendix 5 References

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21. *NEWater Technology*, Singapore Public Utilities Board web resource, https://www.pub.gov.sg/Documents/NEWater%20Technology.pdf
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Appendix 6 List of names endorsing this submission

FRIENDS OF BANKS PENINSULA INC

MISSION IN RELATION TO

AKAROA RECLAIMED WATER BENEFICIAL RE-USE TREATMENT AND DISPOSAL OPTIONS

We hereby endorse the submission of Friends of Banks Peninsula Inc responding to the Akaroa Reclaimed Water Beneficial Reuse, Treatment and Disposal Options consultation released by Christchurch City Council in April 2017 and agree to our names being listed in the submission. (Addresses and contact details redacted).

Name	Address	Contact	Endorse through	Date received
Brent Martin			Contributing author	12 April 17
Suky Thompson			Contributing author	12 April 2017
Averil Parthonnaud			Web form	16 April 2017
Kevin Parthonnaud			Web form	16 April 2017
Fiona Turner			Verbal request	16 April 2017
Sandra Hicks			Web form	16 April 2017
Patsy Turner			Web form	16 April 2017
Josephine Cataliotti			Web form	16 April 2017
Monique Connell			Web form	16 April 2017
Stephanie Connell			Web form	16 April 2017
Suzanne Church			Web form	16 April 2017
Craig Church			Web form	16 April 2017

Andrew Bax	Web form	17 April 2017
Anthea Penny	Web form	17 April 2017
Brent George	Web form	17 April 2017
Jacqui George	Web form	17 April 2017
David Brailsford	Web form	17 April 2017
Jan Cook	Web form	17 April 2017
Garth Tiffen	Web form	17 April 2017
Page Lawson	Web form	17 April 2017
Josie Martin	Web form	17 April 2017
Linda McLachlan	Web form	17 April 2017
Ian Pavitt	Web form	17 April 2017
Liz Daish	Web form	17 April 2017
Helen Briggs	Web form	17 April 2017
Emeritus Professor Helen Leach	Web form	17 April 2017
Georgie Oborne	Handwritten request	17 April 2017
Mike Oborne	Handwritten request	17 April 2017
Sarah Ford	Web form	17 April 2017
Richard Troughton	Web form	17 April 2017
Lorraine Owen	Web form	17 April 2017

Benoit Navarron	Web form	17 April 17
John Wright	Web form	17 April 17
Cherilynn Wright	Web form	17 April 17
Mary Farrell	Web form	18 April 17
Noel Kelly	Web form	18 April 17
Dick Fernyhough	Web form	18 April 17
Graeme Raxworthy & family	Web Form	18 April 17
Lorraine Raxworthy	Web form	18 April 17
Ross Pettersson	Web form	18 April 17
Chris Pottinger	Web Form	18 April 17
Tracey Pottinger	Web form	18 A;pril 17
Chris Moore	Web form	19 April 17
Annette Moore	Web form	19 April 17
Shaun Huddleston	Web form	19 April 17
Brian Eves	Web form	19 April 17
Beverley Reeves	Web form	18 April 17
Thomas Eves	Web form	20 April 17
Michael Browne	Web form	20 April 17
Mary Browne	Web form	20 April 17
Stuart Jeffrey	Web form	20 April 17
David Williams	Web form	20 April 17
Dianne	Web Form	20 April 17

Carson		
Katherine Fraser	Web Form	20 April 17
David Williams	Web Form	20 April 17
Richard Lovett	Web Form	21 April 17
Sue Lovett	Web Form	21 April 17
Mr. Gerald Davison	Web Form	21 April 17
Chris Muirhead	Web Form	21 April 17
Margaret Marion Graham	Web Form	21 April 17
Pat Lyons	Web Form	21 April 17
Wayne Sceats	Web Form	21 April 17
Hugo Tichborne	Web Form	21 April 17
Guy Tichborne	Web Form	21 April 17
Ben Tichborne	Web Form	21 April 17
Lizi Reese	Web Form	21 April 17
Michael Schlumpf	Web Form	21 April 17
Jeremy Carson	Web Form	21 April 17
Denise Wren	Web Form	21 April 17
Lea Hullett	Web Form	22 April 17

Jeanette Emmerson	Web Form	22 April 17
Selwyn Watkins	Web Form	22 April 17
Barbara Watkins	Web Form	22 April 17
Derek Marr	Web Form	22 April 17
Shireen May Helps	Web Form	22 April 17
Francis Helps	Web Form	22 April 17
Mr. Renan cataliotti	Web Form	22 April 17
Rosie Davidson	Web Form	22 April 17
Bryan Tichborne	Web Form	22 April 17
Nancy Tichborne	Web Form	22 April 17
Canalda max	Web Form	22 April 17
Contamine Matthieu	Web Form	22 April 17
Johannah Curwood	Web Form	15 April 17
Pauline Sitter	Web Form	22 April 17
Geraldine Guillemot-Peacock	Web Form	22 April 17
Russell Peacock	Web Form	22 April 17
Flore Mas	Web Form	22 April 17
Amanda Gauntlett	Web Form	22 April 17
Robert Perry	Web Form	22 April 17
Prue Hawkey	Web Form	22 April 17
Maria Bryan	Web Form	23 April 17

Helene Grimaud	Web Form	23 April 17
Mark Wren	Web Form	23 April 17
Hannah Gauntlett	Web Form	23 April 17
Martin Maquire	Verbal endorsement	23 April 17
Ad Sintenie	Web Form	23 April 17
Hollie Hollander	Web Form	23 April 17
Harvey Taylor	Web Form	23 April 17
Lyndsey Rhodes	Web Form	23 April 17
Dot Milne	Web Form	23 April 17
Kathleen Liberty	Web Form	23 April 17
Doig Smith	Web Form	23 April 17
Andrea Smith	Web Form	23 April 17
A.D Murrie	Web Form	23 April 17
Gabriel Calcutt	Web Form	23 April 17
Jamie Palmer	Web Form	23 April 17
Joanna Church	Web Form	23 April 17
Niamh Roche	Web Form	23 April 17
Julian Calcutt	Web Form	23 April 17
Katrina Calcutt	Web Form	23 April 17
Gloria Calcutt	Web Form	23 April 17
Stephen Lelievre	Web Form	23 April 17
Annette Lelievre	Web Form	23 April 17

Cynthia Muir	Web Form	23 April 17
Brent Schluz	Web Form	23 April 17
Chris Shearer	Web Form	23 April 17
Karen Watson	Web Form	23 April 17
Andrea Louisson	Web Form	23 April 17
Tracy Foley	Web Form	23 April 17
Paul MacFarlane	Web Form	23 April 17
Pip MacFarlane	Web Form	23 April 17
Giles Foley	Web Form	24 April 17
Lil Foley	Web Form	24 April 17
Michael Carson	Web Form	24 April 17
Anabel Wilson	Web Form	24 April 17
Lee Robinson	Web Form	24 April 17
Rebecca Barnett	Web Form	24 April 17
Andrew Smith	Web Form	24 April 17
Annie Maillard	Web Form	24 April 17
Jeremy Buchanan	Web Form	24 April 17
Fran Anderson	Web Form	24 April 17
Tony Muir	Web Form	24 April 17
Kerry Little	Web Form	24 April 17
Leanne M Hastie	Web Form	24 April 17

JOHN THOMSON	Web Form	24 April 17
Joanna Hase	Web Form	24 April 17
Marian Robinson	Web Form	24 April 17
Doug Hood	Web Form	24 April 17
Sara Parks	Web Form	24 April 17
Bruce Gauntlett	email	24 April 17
Anne Patterson	Verbal request	24 April 17
Toby Smith	Web Form	24 April 17
Annabella Fleri Soler Smith	Web Form	24 April 17
Garry Moore	Web Form	24 April 17
Catherine Ross	Web Form	24 April 17
Geoff Harris	Web Form	24 April 17
Grant Robertson	Web Form	24 April 17
Tony Mason	Web Form	24 April 17
Frank Coppens	Web Form	24 April 17
Brendan Glover	Web Form	25 April 17
Marion Glover	Web Form	25 April 17
Murray Smith	Web Form	25 April 17
Elizabeth Bain	Web Form	25 April 17
R E Stronach	Web Form	25 April 17
Susan Bruce	Web Form	25 April 17
John Higgins	Web Form	25 April 17

Gavin Shepherd	Web Form	25 April 17
Sonia Shepherd	Web Form	25 April 17
Neil Barnett	Web Form	25 April 17
Gregory Wilson	Web Form	25 April 17
Matthew Gray	Web Form	25 April 17
Grant Horner	Web Form	26 April 17
Bronwyn Horner	Web Form	26 April 17
Peter Steel	Web Form	26 April 17
Ross Shepherd	Web Form	26 April 17
Rob Allen	Web Form	26 April 17
Kosei Ono	Web Form	26 April 17
Pip Mason	Web Form	26 April 17
Emilie Plaetevoet	Web Form	26 April 17
John Baker	Web Form	26 April 17
Kate Robinson	Web Form	26 April 17
Robin Ball	Web Form	26 April 17
Andrea Moore	Web Form	26 April 17
Janna Robinson	Web Form	26 April 17
Eloise Ono	Web Form	26 April 17
Kate Casey	Web Form	26 April 17

Warren Casey	Web Form	26 April 17
David Fleming	Web Form	26 April 17
Wendy Fleming	Web Form	26 April 17
Karen Buchanan	Web Form	26 April 17
Kity Bryce	Web Form	26 April 17
Tony Bryce	Web Form	26 April 17
Kirstin McNabb	Web Form	26 April 17
Sara Black	Web Form	26 April 17
Donna Heenan	Web Form	26 April 17
Robert Steel	Web Form	26 April 17
Clive Weir	Web Form	26 April 17
Frances Baylis	Web Form	26 April 17
Charlotte Oborne	Web Form	27 April 17
Silke Lqssen	Web Form	27 April 17
Kirsten Williams-Hitch	Web Form	27 April 17
David Epstein	Web Form	27 April 17
Rebecca Cooper	Web Form	27 April 17
John Thacker	Web Form	27 April 17
David Thurston	Web Form	27 April 17
Sue Thurston	Web Form	27 April 17
Janet Guard	Web Form	27 April 17

Mary Pauwels	Web Form	27 April 17
Patricia Dart	Web Form	27 April 17
Marie Rhodes	Web Form	27 April 17
Tony Rhodes	Web Form	27 April 17
Ramon Farmer	Web Form	27 April 17
Pamela Fisher	Web Form	27 April 17
Tom Brennan	Web Form	28 April 17
Gary Willis	Web Form	28 April 17
Joanne Willis	Web Form	28 April 17
Catherine White	Web Form	28 April 17
Russell Turner	Verbal request	28 April 17
Sarah Anderson	Web Form	28 April 17
Julia Waghorn	Web Form	28 April 17
Paddy Stronach	Web Form	28 April 17
Lynne Lambert	Web Form	28 April 17
Peter Lambert	Web Form	28 April 17
Dawn Pearson	Web Form	28 April 17
Margaret Smith	Web Form	28 April 17
Kate Haley	Web Form	28 April 17
Chris Walker	Web Form	28 April 17
Sarah Abbott	Web Form	29 April 17
Sylvia McAslan	Web Form	29 April 17

Catherine Anderson	Web Form	29 April 17
Norman Anderson	Web Form	29 April 17
Brigid Rennell	Web Form	29 April 17
Julie Jennings	Web Form	29 April 17
Sally Cates	Web Form	29 April 17
Wirt Cates	Web Form	29 April 17
David Clark	Web Form	29 April 17
Prue Clark	Web Form	29 April 17
Doreen Machnick	Web Form	29 April 17
Juliet Newman	Web Form	29 April 17
Mary Trevella	Web Form	29 April 17
Cameron Trevella	Web Form	29 April 17
Jessica	Web Form	29 April 17
Jan Wallace	Web Form	29 April 17
Jayne Abbott	Web Form	29 April 17
Bill Abbott	Web Form	29 April 17
Jeremy Moore	Web Form	29 April 17
Cathy Smith	Web Form	29 April 17
Alyson Molan	Web Form	29 April 17
Sarah Cook	Web Form	30 April 17
Mike Lawson	Verbal request	30 April 17
Julia	Verbal	30 April 17

Swanwick	request	
Nayland Smith	Web Form and verbal	30 April 17
Tessa Fenton	Verbal request	30 April 17
Jackie Fenton	Verbal request	30 April 17
Hugh Martin	Web Form	30 April 17
Jenney Manks	Web Form	30 April 17
David Manks	Web Form	30 April 17

Submission No: 1016

CHRISTCHURCH CITY COUNCIL
Akaroa Wastewater Scheme

- Received via Have Your Say -

Submissions close 5pm, 30 April 2017

Full Name*:	Paddy Stronach
Contact Address*:	
Postcode:	
Telephone number:	
Email Address:	
Date Sent:	4/30/2017 2:51:23 PM
Would you like to attend the hearings for this consultation?	Yes
I am completing this submission:	For myself
Role within Organisation	N/A
Group/Organisation Names	N/A
How many people do you represent?	N/A
Preferred environment for Akaroa wastewater discharge:	Other
If Other, please describe and state reasons	Reuse Less risk to the environment
Option 1	Option 4 - Non-potable reuse in Akaroa, in combination with another option
Option 2	Option 5 - Disposal via a new outfall pipeline to the mid-harbour
Option 3	Option 2 - Irrigation of trees or pasture at Pompeys Pillar
Option 4	Option 1 - Irrigation of trees or pasture in Robinsons Bay
Option 5	Option 3 - Irrigation of trees or pasture in Takamātua Valley, in combination with another area
Option 6	Please select
Other	
State reasons for ranking	
Would you be more supportive of spray irrigation of treated wastewater to pasture? Why	Prefer drip irrigation to trees. Not convinced pasture is then suitable for stock.

Do you have location preference? Why:	pond 10 Near treatment plant, near Akaroa for reuse.
Should Council add aspirational projects to the Akaroa wastewater scheme?	Fire storage ponds need investigating. Makes sense.
Any other comments?	

Submission No: 1019

CHRISTCHURCH CITY COUNCIL
Akaroa Wastewater Scheme

- Received via Have Your Say -

Submissions close 5pm, 30 April 2017

Full Name*:	Andy & Carol McLenaghan
Contact Address*:	
Postcode:	
Telephone number:	
Email Address:	
Date Sent:	4/30/2017 4:17:34 PM
Would you like to attend the hearings for this consultation?	Yes
I am completing this submission:	For myself
Role within Organisation	
Group/Organisation Names	
How many people do you represent?	
Preferred environment for Akaroa wastewater discharge:	Irrigation of reclaimed water to trees or pasture
If Other, please describe and state reasons	
Option 1	Option 4 - Non-potable reuse in Akaroa, in combination with another option
Option 2	Option 2 - Irrigation of trees or pasture at Pompeys Pillar
Option 3	Option 5 - Disposal via a new outfall pipeline to the mid-harbour
Option 4	Please select
Option 5	Please select
Option 6	Please select
Other	
State reasons for ranking	Akaroa must be part of it's own solution in reusing the waste water. Takamatua and Robinsons Bay are not suitable areas for the pasture or tree irrigation due to the soil types, ground water and number of small blocks.
Would you be more supportive of spray irrigation of treated wastewater to pasture? Why	Pasture at Pompey's Pillar subject to the land owner's agreement and in Akaroa to Reserves and plantings.

Do you have location preference? Why:	Pond 10 subject to the following - Site must be landscaped and not visible from the Main and Old French Roads, no odour whatsoever, no increase in insects in or around the pond, there is a guarantee of treatment of all waste water in providing this pond.
Should Council add aspirational projects to the Akaroa wastewater scheme?	Long term Takamatua should be added to the wastewater scheme due to the use of septic tanks in high ground water areas not performing well.
Any other comments?	We feel due to ongoing water shortages in Akaroa thought should be given at this stage to being able to treat water to the highest standard eg reverse osmosis in the future.

Submission No: 1022

CHRISTCHURCH CITY COUNCIL
Akaroa Wastewater Scheme

- Received via Have Your Say -

Submissions close 5pm, 30 April 2017

Full Name*:	Margaret Wood
Contact Address*:	
Postcode:	
Telephone number:	
Email Address:	
Date Sent:	4/30/2017 5:52:41 PM
Would you like to attend the hearings for this consultation?	No
I am completing this submission:	For myself
Role within Organisation	
Group/Organisation Names	
How many people do you represent?	
Preferred environment for Akaroa wastewater discharge:	Irrigation of reclaimed water to trees or pasture
If Other, please describe and state reasons	
Option 1	Option 4 - Non-potable reuse in Akaroa, in combination with another option
Option 2	Option 2 - Irrigation of trees or pasture at Pompeys Pillar
Option 3	Option 3 - Irrigation of trees or pasture in Takamātua Valley, in combination with another area
Option 4	Option 1 - Irrigation of trees or pasture in Robinsons Bay
Option 5	Option 5 - Disposal via a new outfall pipeline to the mid-harbour
Option 6	Please select
Other	
State reasons for ranking	Pompeys pillar gives waste water further to travel (elevation above sea level) before reaching the sea & therefore even more filtration.
Would you be more supportive of spray irrigation of treated wastewater to pasture? Why	Drip , as often high winds & water may not go where intended.

Do you have location preference? Why:	
Should Council add aspirational projects to the Akaroa wastewater scheme?	
Any other comments?	

Submission No: 1023

CHRISTCHURCH CITY COUNCIL
Akaroa Wastewater Scheme

- Received via Have Your Say -

Submissions close 5pm, 30 April 2017

Full Name*:	Page Lawson
Contact Address*:	
Postcode:	
Telephone number:	
Email Address:	
Date Sent:	4/30/2017 5:54:02 PM
Would you like to attend the hearings for this consultation?	Yes
I am completing this submission:	On behalf of a group or organisation
Role within Organisation	
Group/Organisation Names	
How many people do you represent?	2 - myself and my husband, Stuart Jeffrey
Preferred environment for Akaroa wastewater discharge:	Other
If Other, please describe and state reasons	see attached We prefer beneficial re-use in Akaroa
Option 1	Option 4 - Non-potable reuse in Akaroa, in combination with another option
Option 2	Please select
Option 3	Please select
Option 4	Please select
Option 5	Please select
Option 6	Please select
Other	
State reasons for ranking	see attached
Would you be more supportive of spray irrigation of treated wastewater to pasture? Why	see attached

Do you have location preference? Why:	pond site 10 - see attached
Should Council add aspirational projects to the Akaroa wastewater scheme?	see attached
Any other comments?	see attached

Akaroa Wastewater Submission

The Akaroa Wastewater Treatment Hearing Panel has some very hard decisions to make – how to disperse Akaroa's treated wastewater in a way that is acceptable to the wider community. We strongly urge you to take a stance of voluntary beneficial re-use (the water is an asset) as opposed to disposal (the water is waste). Water is becoming an issue worldwide, it already is an issue in Akaroa in summer, and this is expected to increase in time. This is the perfect opportunity for the Christchurch City Council to lead New Zealand in an innovative approach to dealing with effluent, a way that is currently used in many places in the world.

We submit the following approach is taken:

1 First and foremost an education campaign in Akaroa to reduce the amount of effluent going into the system. We are even in favour of water usage charges.

2 It just makes sense to us to treat the effluent to the highest possible level given the available technology and the benefits: it will be safe to use on salad crops and the many other domestic uses such as boat and car washing, lawn sprinkling…; if it needs to be released into local streams due to emergency pond overflow denitrified water would have negligible impact on stream and harbour flora and fauna; the application of treated water to trees is much easier as the over nitrification of the soils becomes easier to manage; treating the effluent to the highest possible level is most respectful to Papatūānuku.

3 We support pond Site 10 – storing the unused treated water at a place it can easily be distributed to people who choose to use it to water their gardens, farms, orchards in Akaroa and further afield. The pond is to be covered to stop midges (such a problem at Bromley), mosquitos and to keep bird droppings from re-contaminating the water.

4 We support Re-Use in Akaroa with an interim harbour outfall while the purple pipe system is extended throughout Akaroa and beyond, people are educated in its benefits and encouraged to be creative with its uses (uses we haven't even thought of yet) and actually utilize the final end product. The effluent is Akaroa's and we feel it should go back to Akaroa not sent off to neighbouring communities which we consider culturally insensitive.

   All of the issues of the treated water application (cultural sensitivity to sending it to the harbour, not just by the iwi, and cultural insensitivity in sending it to land) would be eased if the effluent is treated to the best quality it can be. Whatever its end uses the cleaner it is the better.

   It is great the Council is looking at using some of the treated water in public toilets and parks. All of the treated water could be used in Akaroa and beyond and we think it's important that the Council

make it part of their long term plan to extend the purple pipe system throughout Akaroa so that those who choose to use it can. It would be a minimal cost (Council could even cover that too) to bring the pipe from a property boundary to the garden and put a tap on it. As well as Akaroa gardens, the water would become desirable for horticultural uses, groundwater recharging and biodiversity reserves establishment as stated in the FRIENDS of Banks Peninsula Submission.

Unused treated water would go to a harbour outfall as recommended in the FRIENDS of Banks Peninsula submission – the purple pipe to extend to the end of the Glen with a pipe extending into the harbour from there instead of from Childrens Bay (much shorter and much less expensive).

With irrigation to trees in Robinson's Bay, the Council says it will take 5-7 years for the trees to establish enough to take the full amount of treated water. In the meantime, under this scheme, as well as the new treatment plant, the Takapūneke plant will continue to operate and treated water will still go to the harbour. With the aim to re-use all the treated water in Akaroa, the Takapūneke plant could stop as soon as the initial purple pipes are in, the new plant would send the treated water to either the old outfall or a new outfall further into the harbour from the north end of the purple pipe and the money not being spent on setting up the large ponds and irrigation could be spent on putting more purple pipes in Akaroa and finding/encouraging home owners and farmers who would like to use the water.

Emergency treated water overflow: we support any emergency treated water outflow be released either to the harbour directly or through pond 10 outfall to streams and hence to the harbour.

5 We understand that the Pompey's Pillar landowners do not want to have their land used for the disposal of the treated water. If an agreement between them and the Council could be reached we would still prefer the interim harbour outfall as it would be the least expensive option and would allow for the most resources to be put to implementing the purple pipes.

6 We do not support compulsorily disposal of Akaroa's treated water in either Takamatua or Robinson's Bay as it is culturally insensitive, unwanted by those who live there and unnecessary.

We have lived in the Takamatua valley for 12 years. We love the valley, the community here (mostly permanent - there are very few baches in the valley) and our bit of paradise. We have 2.5 organic (not certified) hectares planted with proteaceae (proteas, leucodendrons and leucospermums), fruit and lemon trees, and we have grown vegetables and garlic for the local market. We believe in healthy soil, healthy plants, healthy people. We are proud that no chemical fertilizers, insecticides or herbicides have been used on our property since we bought it.

Our property does have a bit of land (which has lemon and fruit trees growing on it) selected for use in the Takamatua irrigation scheme which continues on to our neighbours adjoining land down beside our house. We do not want to be forced to have the treated water 'disposed' of on or near our land. If it was treated to the highest quality possible and we could apply it when and where we wanted it we might be up for taking some.

Being told that regardless of how we feel, our property and the valley (whose beauty is part of why we chose to live here) is going to be used to dispose of Akaroa's treated wastewater, not even our own, is repugnant. Part of the joy of owning our own property is that we can do what we want within the organic parameters we have set, but this is not the case if it is used to dispose of Akaroa's wastewater as there are no controls as to what goes into the waste stream (paint, harsh cleaning chemicals, etc).

We understand that to Ngāi Tahu disposing of wastewater to the harbour, their food basket, is very insensitive. Disposing of it to the land, our food basket, is the same for us.

With Options 1 (irrigation to Robinsons Bay), 2 (irrigation to Pompey's Pillar) and 3 (irrigation to Takamatua Valley) the Council intends to 'dispose' of Akaroa's wastewater. Only Option 4 treats the water as an asset to be used voluntarily, not forced to have it disposed of on a person's home. Akaroa faces water shortages every summer. It is only logical to use the treated water as an asset in Akaroa. Council has said that the new plant will be expected to be used for a very long time (we heard 100 years mentioned by a Council representative). It only makes sense to design it to the highest standards, building in the ability to upgrade the plant so it will be something to be proud of for generations. It makes financial and cultural sense to spend the money now to make it the very best it can be, even building in the ability to upgrade the plant in future.

We have endorsed the FRIENDS of Banks Peninsula submission. They have thoroughly researched all angles of dealing with Akaroa's wastewater, hired experts to look for other, simple and creative, solutions besides disposal. It is understandable that PDP and Beca desire more complicated large ponds and extensive irrigation as it will bring their businesses a larger profit (Is this a conflict of interest?)

It is great to be involved in creating this world leading treatment system. Everyone involved is to be commended for the effort they have put in and their willingness to think outside the box, efforts have been made and mountains have been climbed. We encourage you to take the bold step of imagining and realising the very best effluent treatment system.

Let's work together to make a wastewater system that we and future generations can be proud of.

WE WISH TO BE HEARD

Stuart Jeffrey and Page Lawson

Submission No: 1028

CHRISTCHURCH CITY COUNCIL
Akaroa Wastewater Scheme

- Received via Have Your Say -

Submissions close 5pm, 30 April 2017

Full Name*:	Gill Bedford
Contact Address*:	
Postcode:	
Telephone number:	
Email Address:	
Date Sent:	5/1/2017 8:11:53 AM
Would you like to attend the hearings for this consultation?	No
I am completing this submission:	For myself
Role within Organisation	
Group/Organisation Names	
How many people do you represent?	
Preferred environment for Akaroa wastewater discharge:	Other
If Other, please describe and state reasons	Reuse of water in Akaroa
Option 1	Option 4 - Non-potable reuse in Akaroa, in combination with another option
Option 2	Option 2 - Irrigation of trees or pasture at Pompeys Pillar
Option 3	Please select
Option 4	Please select
Option 5	Please select
Option 6	Please select
Other	
State reasons for ranking	Option 1 is an essential part of this project moving forward. Option 2 is viable if conditions with land owner are met.
Would you be more supportive of spray irrigation of treated wastewater to pasture? Why	

Do you have location preference? Why:	Pond 10 - close to plant and provides opportunity to retreat excess water
Should Council add aspirational projects to the Akaroa wastewater scheme?	Yes
Any other comments?	Fire storage ponds are essential for the future and reticulated wastewater for Takamatua and Robinsons Bay would solve the issue of many outdated and inefficient septic tanks.

Submission No: 1030

CHRISTCHURCH CITY COUNCIL
Akaroa Wastewater Scheme

- Received via Have Your Say -

Submissions close 5pm, 30 April 2017

Full Name*:	Trevor Bedford
Contact Address*:	
Postcode:	
Telephone number:	
Email Address:	
Date Sent:	5/1/2017 8:21:29 AM
Would you like to attend the hearings for this consultation?	No
I am completing this submission:	For myself
Role within Organisation	
Group/Organisation Names	
How many people do you represent?	
Preferred environment for Akaroa wastewater discharge:	Other
If Other, please describe and state reasons	Reuse of water in Akaroa
Option 1	Option 4 - Non-potable reuse in Akaroa, in combination with another option
Option 2	Option 2 - Irrigation of trees or pasture at Pompeys Pillar
Option 3	Please select
Option 4	Please select
Option 5	Please select
Option 6	Please select
Other	
State reasons for ranking	Option 1 is an essential part of this project moving forward. Option 2 is viable if conditions with landowners are met.
Would you be more supportive of spray irrigation of treated wastewater to pasture? Why	

Do you have location preference? Why:	Pond 10 - close to treatment plant and provides opportunity to retreat excess water.
Should Council add aspirational projects to the Akaroa wastewater scheme?	Yes. Fire storage ponds are essential and reticulated wastewater schemes to Robinsons Bay and Takamatua would solve the issue of many outdated and inefficient septic tanks.
Any other comments?	

1031

Submission form continued

Contact details

Contact name BARRY BRUNTON

Organisation name (if representing) —.

Contact address

Postcode

Phone number (day)

Phone number (evening)

Email (if applicable)

Signature BBrunton Date 24/4/17.

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Do you wish to present your submission at the hearing? Please tick one of the boxes below:

Please note that deputations will not be permitted at the meeting where the Council makes its decision.

☐ Yes – I/We would like to be heard

☑ No – I/We do not want to be heard

No anonymous submissions/feedback will be accepted.

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FREEPOST Authority No.178

Christchurch City Council

Free

Attention: Hearings Team
Akaroa Wastewater Scheme
Christchurch City Council
PO Box 73016
Christchurch Mail Centre
Christchurch 8154

tape here tape here

Submission form

haveyoursay
www.ccc.govt.nz/haveyoursay

PLEASE READ BEFORE COMPLETING YOUR SUBMISSION

The Christchurch City Council is seeking your feedback on the five proposed options for the Akaroa wastewater project:

- **Option 1 – Irrigation of trees or pasture in Robinsons Bay**
- **Option 2 – Irrigation of trees or pasture at Pompeys Pillar**
- **Option 3 – Irrigation of trees or pasture in Takamātua Valley, in combination with another area**
- **Option 4 – Non-potable re-use in Akaroa, in combination with another option**
- **Option 5 – Disposal via a new outfall pipeline to the mid-harbour**

Submissions are public information

Please note: Your full name, address and telephone number are required because this information is important for transparency, and for Christchurch City Council's decision-making process. It also means we can update you on progress. Ideally we would like your email address too, if you have one, as this makes it easier for us to stay in touch with you throughout the engagement process.

Your submission, including your name and contact details, will be made available to the decision-making body, for example the Community Board, Committee and/or Council, to help them make an informed decision.

Submissions, **with names but without contact details**, are made available online once the Board, Committee or Council agenda goes live on the Council website.

If requested, Council is legally required to make all written and/or electronic submissions available to the public, including the name and contact details of the submitter, subject to the provisions of the Local Government Official Information and Meetings Act 1987.

If you believe there are compelling reasons why your contact details and/or submission should be kept confidential, please contact the Council's Engagement Manager on (03) 941 8999 or 0800 800 169 (Banks Peninsula residents).

How to give us your feedback

You can use this submission form or you can provide your feedback in a number of ways:

- **Online:** You may enter your submission using the online form provided on the Council's website at **ccc.govt.nz/haveyoursay**
- **By email:** akaroawwproject@ccc.govt.nz
  Please make sure your full name and address is included with your submission.
- **By mail (no stamp required):**
  Freepost 178
  Attention: Hearings Team
  Akaroa Wastewater Scheme
  Christchurch City Council
  PO Box 73016
  Christchurch Mail Centre
  Christchurch 8154
- **By hand delivery to:** Civic Offices, 53 Hereford Street, Christchurch or at the drop-in sessions

Consultation closes on Sunday 30 April 2017

Fundamentally, what environment would you prefer Akaroa wastewater is discharged into?

- ☐ Irrigation of reclaimed water to trees or pasture
- ☑ Disposal via a new outfall pipeline to the mid-harbour
- ☐ Other (please describe)

Please state your reasons why: If the treated water is of very good quality, I think the environmental impact would be minimal.

Please rate the options listed below with a number according to your preference, with 1 being your most preferred option and 5 your least preferred option (please note the options below are in no particular order).

- [3] Option 1 – Irrigation of trees or pasture in Robinsons Bay
- [3] Option 2 – Irrigation of trees or pasture at Pompeys Pillar
- [3] Option 3 – Irrigation of trees or pasture in Takamātua Valley, in combination with another area
- [5] Option 4 – Non-potable reuse in Akaroa, in combination with another option
- [1] Option 5 – Disposal via a new outfall pipeline to the mid-harbour
- ☐ Other (please describe)

Please state your reasons for this ranking:

Continued overleaf

Would you be more supportive of spray irrigation of treated wastewater to pasture or drip irrigation to trees? Please state your reasons why:

Not in favour of spray irrigation. Experience from the dairy sector spraying effluent on pasture shows that this is not a desireable practice for a number of reasons.

Do you have a preference for the location of reclaimed water storage pond(s)? Please state your reasons why:

No.

Do you think the Council should add aspirational projects to the Akaroa wastewater scheme (e.g. fire storage ponds, providing a reticulated wastewater scheme in Takamātua Valley)? If so, which ones do you support and why?

Do you have any other comments? (Please use additional paper if required):

I have concerns that the treated water is "safe for irrigation except for raw food crops".
The opposition from a cultural group regarding the harbour discharge should be heard but not given great weight. Discharges from heat exchangers on cruise ships & commercial vessels are accepted without comment. If discharge do adopted, the outflow could be outside the heads.

Thank you for taking the time to respond. Please include you contact details over the page.

1032

Submission form continued

Contact details

Contact name Alan Turnbull

Organisation name (if representing) N/A.

Contact address

Postcode

Phone number (day)

Phone number (evening)

Email (if applicable)

Signature A Turnbull Date 26.4.17

fold

Do you wish to present your submission at the hearing? Please tick one of the boxes below:

Please note that deputations will not be permitted at the meeting where the Council makes its decision.

- [ ] Yes – I/We would like to be heard
- [x] No – I/We do not want to be heard

No anonymous submissions/feedback will be accepted.

fold

FREEPOST Authority No.178

Christchurch City Council

810-17 26 APR 17 CARRIED BY NEW ZEALAND POST

Free

))) GOT A QUESTION? VISIT WWW.NZPOST.NZ/HELP

tape here

Attention: Hearings Team
Akaroa Wastewater Scheme
Christchurch City Council
PO Box 73016
Christchurch Mail Centre
Christchurch 8154

tape here

Submission form

haveyoursay
www.ccc.govt.nz/haveyoursay

PLEASE READ BEFORE COMPLETING YOUR SUBMISSION

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- **Option 1 – Irrigation of trees or pasture in Robinsons Bay**
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  Please make sure your full name and address is included with your submission.
- **By mail (no stamp required):**
  Freepost 178
  Attention: Hearings Team
  Akaroa Wastewater Scheme
  Christchurch City Council
  PO Box 73016
  Christchurch Mail Centre
  Christchurch 8154
- **By hand delivery to:** Civic Offices, 53 Hereford Street, Christchurch or at the drop-in sessions

Consultation closes on Sunday 30 April 2017

Fundamentally, what environment would you prefer Akaroa wastewater is discharged into?

- [ ] Irrigation of reclaimed water to trees or pasture
- [x] Disposal via a new outfall pipeline to the mid-harbour
- [ ] Other (please describe)

Please state your reasons why: This was original planned discharge system - the where Ngai Tahu consulted all along the planning process

Please rate the options listed below with a number according to your preference, with 1 being your most preferred option and 5 your least preferred option (please note the options below are in no particular order).

- [ ] Option 1 – Irrigation of trees or pasture in Robinsons Bay
- [3] Option 2 – Irrigation of trees or pasture at Pompeys Pillar
- [ ] Option 3 – Irrigation of trees or pasture in Takamātua Valley, in combination with another area
- [2] Option 4 – Non-potable reuse in Akaroa, in combination with another option
- [1] Option 5 – Disposal via a new outfall pipeline to the mid-harbour
- [ ] Other (please describe)

Please state your reasons for this ranking: The options for irrigation in Takamatua and Robinsons Bay are not an at all - They should not have to accept Akaroa's waste water at all

Continued overleaf

Would you be more supportive of spray irrigation of treated wastewater to pasture or drip irrigation to trees? Please state your reasons why:

Only Only if the land owners are in full agreement
- Right areas and appropriate tree species - indigenous varieties.

Do you have a preference for the location of reclaimed water storage pond(s)? Please state your reasons why:

There should be no where near houses etc as their likely effect upon residents would be detrimental. - see current long term ongoing problems with smell and midges in Bromley area in Chch city

Do you think the Council should add aspirational projects to the Akaroa wastewater scheme (e.g. fire storage ponds, providing a reticulated wastewater scheme in Takamātua Valley)? If so, which ones do you support and why?

Any projects that would use the waste water in an appropriate + useful manner should be explored. Fire fighting important
Purple pipe system to CCC. Recreation + the to private homes a possibility.

Do you have any other comments? (Please use additional paper if required):

I feel the residents of Takamatua and Robinsons Bays with support from Akaroa should take the example strong demonstrated by Ngai Tahu ie This is where we live and proposed waste water options to our bays are not acceptable. Period! Why should these folk roll over and accept these plans.

How is it that water is completely recycled many times in large urban areas in the world e.g Paris, London, and this cannot be done on a small scale for Akaroa

Thank you for taking the time to respond. Please include you contact details over the page.

1033

Submission form continued

Contact details

Contact name MARY AND MICHAEL BROWNE

Organisation name (if representing) —

Contact address

Postcode

Phone number (day)

Phone number (evening)

Email (if applicable)

Signature M. E. Browne M Browne Date 24 April 2017

fold fold

Do you wish to present your submission at the hearing? Please tick one of the boxes below:

Please note that deputations will not be permitted at the meeting where the Council makes its decision.

☐ Yes – I/We would like to be heard

☑ No – I/We do not want to be heard

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- [ ] Disposal via a new outfall pipeline to the mid-harbour
- [ ] Other (please describe)

Please state your reasons why:

see attached submission

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- [x] Option 4 – Non-potable reuse in Akaroa, in combination with another option
- [ ] Option 5 – Disposal via a new outfall pipeline to the mid-harbour
- [ ] Other (please describe)

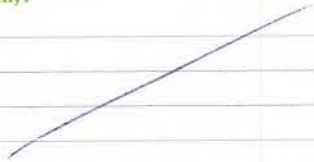
Please state your reasons for this ranking:

see attached submission

Continued overleaf

Please state your reasons why:

Do you think the Council should add aspirational projects to the Akaroa wastewater scheme (e.g. fire storage ponds, providing a reticulated wastewater scheme in Takamātua Valley)? If so, which ones do you support and why?



Do you have any other comments? (Please use additional paper if required):

Attached

Thank you for taking the time to respond. Please include you contact details over the page.

SUBMISSION ON AKAROA WASTEWATER SCHEME

From Mary and Michael Browne

A proposal of this size and cost should encompass innovative options such as the reuse of water in the area where feasible.

We are both Pavitt descendants and have used the Pavitt Cottage, 5 Sawmill Road, for many family events.

We strongly object to the possibility of any wastewater treatment solution being accommodated in Robinsons Bay, especially in the upper reaches above Sawmill Road. This would have a serious impact on the spring fed water supply source for the Cottage and protected by a legal easement, and within a potential pond site and spray and dripper potential irrigation site as shown on the maps. This would also impact on all other water supply (well) systems used by other residents in the valley. The proposed ponds and irrigation areas would ruin the outlook from the Cottage and cause odour problems.

The proposed buffer zone with spray application might work in perfectly draining, level soil – until it reaches an aquifer. We live on countryside near Dunedin where loess type landscape is common, as it is on Banks Peninsula. Water lost from, for example, damaged pipelines into the structures often develop deep long under runners before emerging somewhere further down the slope. The Consultants 25 meter buffer zone is quite fanciful. The addition of one following zero might be a better guess.

We have been frequent visitors to Akaroa since 1972. There has always been a problem with insufficient water over the summer months for the needs of the town and it seems to us quite astounding that the experience of similar communities elsewhere has not been used to form the basis of these current proposals. Surely Option 4 Proposal should be the only proposal! Keeping and reusing water in the local area must be the most sensible and cost effective method. Flushing toilets, watering trees and garden with scarce and expensive potable water makes no sense.

In Dunedin the Otago Regional Council has granted funds to one of the public golf courses for such a study "grey water usage was common on golf courses internationally". There will be many communities in Australia with experience in this field of water conservation.

M & Browne

M Browne

1034

Submission form continued

Contact details

Contact name Colin Hammond

Organisation name (if representing)

Contact address

Postcode

Phone number (day)

Phone number (evening)

Email (if applicable)

Signature Col Hamm

Date 23/4/17

fold fold

Do you wish to present your submission at the hearing? Please tick one of the boxes below:

Please note that deputations will not be permitted at the meeting where the Council makes its decision.

- [ ] Yes – I/We would like to be heard
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I won't be attending but would like my views considered

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Attention: Hearings Team
Akaroa Wastewater Scheme
Christchurch City Council
PO Box 73016
Christchurch Mail Centre
Christchurch 8154

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Submission form

haveyoursay
www.ccc.govt.nz/haveyoursay

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Consultation closes on Sunday 30 April 2017

Fundamentally, what environment would you prefer Akaroa wastewater is discharged into?

- [x] Irrigation of reclaimed water to trees or pasture
- [ ] Disposal via a new outfall pipeline to the mid-harbour
- [ ] Other (please describe)

Please state your reasons why: Using water to create growth is a better option than the others. Works well overseas.

Please rate the options listed below with a number according to your preference, with 1 being your most preferred option and 5 your least preferred option (please note the options below are in no particular order).

- [ ] Option 1 – Irrigation of trees or pasture in Robinsons Bay
- [x] Option 2 – Irrigation of trees or pasture at Pompeys Pillar
- [ ] Option 3 – Irrigation of trees or pasture in Takamātua Valley, in combination with another area
- [ ] Option 4 – Non-potable reuse in Akaroa, in combination with another option
- [ ] Option 5 – Disposal via a new outfall pipeline to the mid-harbour
- [ ] Other (please describe)

Please state your reasons for this ranking: My view is that this process has not been communicated that well, in terms of the science behind the process. Because of this the CCC is likely to experience resentment & criticism. Pompeys may be one way of mitigating "backlash."

Continued overleaf

Would you be more supportive of spray irrigation of treated wastewater to pasture or drip irrigation to trees? Please state your reasons why:

Either - preferably drip irrigation as this may be less unsightly. Good that it matters if the Pompeii option is on the table.
Spray could potentially cover more area and, if this is what is required, then would be ideal.

Do you have a preference for the location of reclaimed water storage pond(s)? Please state your reasons why:

No preference if Pompeii is the selected destination as this would have little effect on the visual ambience entering or exiting Akaroa.

Do you think the Council should add aspirational projects to the Akaroa wastewater scheme (e.g. fire storage ponds, providing a reticulated wastewater scheme in Takamātua Valley)? If so, which ones do you support and why?

Some farmers close to town may be keen on offering their land as a "project" to provide nutrients/water etc for irrigation.
We own land and irrigation is always an issue. If the potential o these then this may be a considered option. So long as the science behind this is clearly articulated to those who want to explore this.

Do you have any other comments? (Please use additional paper if required):

As stated earlier, I believe the science behind this process is fine. I believe the process used to articulate the LOC through consultation has been a little fraught.
Sometimes its better to "outsource delicate issues" to an independent consultancy organisation who are experienced in this line of work.

Key issues to me are:
- location, my preference is Pompeii's.
- Aesthetically unobtrusive
- No detrimental effect on preferred landscape - short term/long term
- Local firms used in the construction of plant etc. Or given priority if they have the skills necessary.

Thank you for taking the time to respond. Please include you contact details over the page.

Submission No: 1038

CHRISTCHURCH CITY COUNCIL
Akaroa Wastewater Scheme

- Received via Have Your Say -

Submissions close 5pm, 30 April 2017

Full Name*:	Derek Marr
Contact Address*:	
Postcode:	
Telephone number:	
Email Address:	
Date Sent:	5/1/2017 8:59:50 AM
Would you like to attend the hearings for this consultation?	No
I am completing this submission:	For myself
Role within Organisation	
Group/Organisation Names	
How many people do you represent?	
Preferred environment for Akaroa wastewater discharge:	Other
If Other, please describe and state reasons	Option 4 as outlined in Counsultation 3 - 30 April 2017 together with an Ocean outfall until all water can be reused through both the purple pipe system and on to full reuse for Akaroa residents I have had experience in using Kline or sprinkler irrigation on soils similar to those that exist here on Banks Peninsula viz clay based souls that exhibit poor drainage. Take my word for it, you will have major problems avoiding/managing runoff. Sprinkler or Kline application is a crude way of applying water to land Application to trees may well provide a safer option to avoid land saturation and runoff The option to recycle all water back to Akaroa providing the correct treatment is carried out (reverse osmosis) will provide the best long term solution. Water is a scarce commodity and with climate change predicting a drier climate with more frequent storm events this is the only sensible option long term. Do it once and do it right
Option 1	Please select
Option 2	Please select
Option 3	Please select
Option 4	Please select
Option 5	Please select
Option 6	Please select

Other	See above
State reasons for ranking	See above
Would you be more supportive of spray irrigation of treated wastewater to pasture? Why	Outlined above but application to trees would be preferred over pasture
Do you have location preference? Why:	Pond 10. Best site close to treatment Least visual impact No issues with contamination with any nearby streams
Should Council add aspirational projects to the Akaroa wastewater scheme?	Fire storage ponds make sense
Any other comments?	

Submission No: 1041

CHRISTCHURCH CITY COUNCIL
Akaroa Wastewater Scheme

- Received via Have Your Say -

Submissions close 5pm, 30 April 2017

Full Name*:	Simon Hadfield
Contact Address*:	
Postcode:	
Telephone number:	
Email Address:	
Date Sent:	5/1/2017 11:05:20 AM
Would you like to attend the hearings for this consultation?	No
I am completing this submission:	
Role within Organisation	
Group/Organisation Names	
How many people do you represent?	
Preferred environment for Akaroa wastewater discharge:	Disposal via a new outfall pipeline to the mid-harbour
If Other, please describe and state reasons	There is no other real logical option , the geographical location on Akaroa leaves only real option Harbor out flow
Option 1	Please select
Option 2	Please select
Option 3	Please select
Option 4	Option 4 - Non-potable reuse in Akaroa, in combination with another option
Option 5	Please select
Option 6	Please select
Other	
State reasons for ranking	Any other opinion has to many negative out comes ,spray irrigation is unacceptable, drift from spay, health risk, long term effects on land with leakage over years into waterways
Would you be more supportive of spray irrigation of treated wastewater to pasture? Why	no

Do you have location preference? Why:	pond 10 and 6
Should Council add aspirational projects to the Akaroa wastewater scheme?	
Any other comments?	

1043

Submission form continued

Contact details

Contact name Marilyn Woodley

Organisation name (if representing)

Contact address

Postcode

Phone number (day) Phone number (evening)

Email (if applicable)

Signature M.D. Woodley Date 24-4-2017

fold fold

Do you wish to present your submission at the hearing? Please tick one of the boxes below:

Please note that deputations will not be permitted at the meeting where the Council makes its decision.

☐ Yes – I/We would like to be heard

☑ No – I/We do not want to be heard

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fold fold

FREEPOST Authority No.178

Christchurch City Council

Free

Attention: Hearings Team
Akaroa Wastewater Scheme
Christchurch City Council
PO Box 73016
Christchurch Mail Centre
Christchurch 8154

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28 APR 2017
Akaroa Service Centre
Chch City Council

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Submission form

haveyoursay
www.ccc.govt.nz/haveyoursay

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Consultation closes on Sunday 30 April 2017

Fundamentally, what environment would you prefer Akaroa wastewater is discharged into?

- ☐ Irrigation of reclaimed water to trees or pasture
- ☑ Disposal via a new outfall pipeline to the mid-harbour
- ☑ Other (please describe) Re-use.

Please state your reasons why: (1) 2 methods which can be controlled without the weather making an impact. (2) Best impact on residents lives, properties and lifestyle.

Please rate the options listed below with a number according to your preference, with 1 being your most preferred option and 5 your least preferred option (please note the options below are in no particular order).

- [5] Option 1 – Irrigation of trees or pasture in Robinsons Bay
- [3] Option 2 – Irrigation of trees or pasture at Pompeys Pillar
- [4] Option 3 – Irrigation of trees or pasture in Takamātua Valley, in combination with another area
- [2] Option 4 – Non-potable reuse in Akaroa, in combination with another option
- [1] Option 5 – Disposal via a new outfall pipeline to the mid-harbour
- ☐ Other (please describe)

Please state your reasons for this ranking: As above, but as I am not professional in this area of environmental impact, please read accompanying letter.

Continued overleaf

Would you be more supportive of spray irrigation of treated wastewater to pasture or drip irrigation to trees? Please state your reasons why:

Do - very little control as weather is a complete unknown.
- Impact on peoples lives, loss of value of properties, odour, Maybe stagnant water and visual impact

Do you have a preference for the location of reclaimed water storage pond(s)? Please state your reasons why:

Yes - Site 9 as illustrated in this booklet
a) Close to treatment (proposed) plant therefore less cost little impact on ownership of land are easily accessible therefore can be used for firefighting.

Do you think the Council should add aspirational projects to the Akaroa wastewater scheme (e.g. fire storage ponds, providing a reticulated wastewater scheme in Takamātua Valley)? If so, which ones do you support and why?

These projects certainly could have added value to the scheme but for now get the plant operating with the proviso that these things can be added.

Do you have any other comments? (Please use additional paper if required):

See accompanying letter.

Thank you for taking the time to respond. Please include you contact details over the page.

84 Pipers Valley
R.D.1. Akaroa 7581

Attn - Submission panel.

In response to these sought after submissions I would like to add to my submission in the form of this letter stating some of my concerns.

My family have been on the Peninsula since 1841 and I feel very strongly about the direction the township is heading.

The reality of this section of the infrastructure is that we have to find a workable solution. None of the options can be 100% perfect, so we need to move towards the solution that has the least impact on the environment peoples lives and the future of our town. As well as the impact on the above, we need to make sure we choose a solution that has the ability to allow us to have the most control over. I would not like to choose a solution which can have a weather based impact, because it is too late once a deluge of rain, snow etc has done the damage. We can control the 2 options I have chosen in my submission. However even these options have some concerns, eg. level of Nitrogen in the harbour and the impact on sea life. We need professional advice which I am sure you will seek. We also need reassurance on the level of harmful bacteria with the use of irrigating a public Area, and general re-use of the waste water. Again we need to seek professional advice regarding these levels of bacteria etc.

Of Urgent consideration to me is the direction the town is taking. In my opinion we seem to leave infrastructure to the last consideration and just keep growing the population and visitor numbers. Our town needs to keep that lovely feel of space, quietness and caring and not one of busyness, noise and rush. Please don't let our town vanish in quality of life for the sake of Money. You will sustain the quality for the longer term if we get it right.

Yours faithfully
Marilyn Woodley.

1046

Submission form continued

Contact details

Contact name Rosalind Smith

Organisation name (if representing)

Contact address

Postcode

Phone number (day)

Phone number (evening)

Email (if applicable)

Signature R Smith Date 28.4.17

fold fold

Do you wish to present your submission at the hearing? Please tick one of the boxes below:

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☐ Yes – I/We would like to be heard

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Christchurch City Council

Free

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  Freepost 178
  Attention: Hearings Team
  Akaroa Wastewater Scheme
  Christchurch City Council
  PO Box 73016
  Christchurch Mail Centre
  Christchurch 8154
- **By hand delivery to:** Civic Offices, 53 Hereford Street, Christchurch or at the drop-in sessions

Consultation closes on Sunday 30 April 2017

Fundamentally, what environment would you prefer Akaroa wastewater is discharged into?

- ☐ Irrigation of reclaimed water to trees or pasture
- ☑ Disposal via a new outfall pipeline to the mid-harbour
- ☐ Other (please describe)

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28 APR 2017
BY: Civic Offices
#8133

Please state your reasons why:

Please rate the options listed below with a number according to your preference, with 1 being your most preferred option and 5 your least preferred option (please note the options below are in no particular order).

- ☐ Option 1 – Irrigation of trees or pasture in Robinsons Bay
- ☐ Option 2 – Irrigation of trees or pasture at Pompeys Pillar
- ☐ Option 3 – Irrigation of trees or pasture in Takamātua Valley, in combination with another area
- ☐ Option 4 – Non-potable reuse in Akaroa, in combination with another option
- ☑ Option 5 – Disposal via a new outfall pipeline to the mid-harbour
- ☐ Other (please describe)

Please state your reasons for this ranking:

easier on the environment.
less expensive

Continued overleaf

Would you be more supportive of spray irrigation of treated wastewater to pasture or drip irrigation to trees? Please state your reasons why:

Not supportive of treated water for irrigation.

Do you have a preference for the location of reclaimed water storage pond(s)? Please state your reasons why:

Do you think the Council should add aspirational projects to the Akaroa wastewater scheme (e.g. fire storage ponds, providing a reticulated wastewater scheme in Takamātua Valley)? If so, which ones do you support and why?

Support none

Do you have any other comments? (Please use additional paper if required):

Treated Sewage is discharged into the harbour from Duvauchelle, with no objections.
Why not Akaroa treated wastewater to have the same outfall into the harbour.

Thank you for taking the time to respond. Please include you contact details over the page.

1048

Submission form continued

Contact details

Contact name MICHAEL NORRIS

Organisation name (if representing)

Contact address

Postcode

Phone number (day)

Phone number (evening)

Email (if applicable)

Signature Date 28/4/17.

fold fold

Do you wish to present your submission at the hearing? Please tick one of the boxes below:

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☐ Yes – I/We would like to be heard

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FREEPOST Authority No.178

Christchurch City Council

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Submission form

haveyoursay
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- **Option 4 – Non-potable re-use in Akaroa, in combination with another option**
- **Option 5 – Disposal via a new outfall pipeline to the mid-harbour**

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Fundamentally, what environment would you prefer Akaroa wastewater is discharged into?

- [x] **Irrigation of reclaimed water to trees or pasture**
- [ ] **Disposal via a new outfall pipeline to the mid-harbour**
- [ ] **Other (please describe)**

Please state your reasons why: Midharbour seems too close. Open sea outside heads if feasible would be No 1 preference, otherwise irrigation as ticked

Please rate the options listed below with a number according to your preference, with 1 being your most preferred option and 5 your least preferred option (please note the options below are in no particular order).

- [ ] **Option 1 – Irrigation of trees or pasture in Robinsons Bay**
- [2] **Option 2 – Irrigation of trees or pasture at Pompeys Pillar**
- [ ] **Option 3 – Irrigation of trees or pasture in Takamātua Valley, in combination with another area**
- [1] **Option 4 – Non-potable reuse in Akaroa, in combination with another option**
- [ ] **Option 5 – Disposal via a new outfall pipeline to the mid-harbour**
- [ ] **Other (please describe)**

Please state your reasons for this ranking: Conservation and reuse of water in a peninsula prone to water restrictions makes sense.

Continued overleaf

Would you be more supportive of spray irrigation of treated wastewater to pasture or drip irrigation to trees? Please state your reasons why:

Prefer tree irrigation by drip but not strongly opposed to spray either.

Do you have a preference for the location of reclaimed water storage pond(s)? Please state your reasons why:

Accessible to Akaroa residents would be logical.

Do you think the Council should add aspirational projects to the Akaroa wastewater scheme (e.g. fire storage ponds, providing a reticulated wastewater scheme in Takamātua Valley)? If so, which ones do you support and why?

Like Fire storage ponds — Akaroa can never have too much water!

Do you have any other comments? (Please use additional paper if required):

I don't support the use of Takamatua Valley for storage ponds as I believe they would cause unacceptable levels of intrusion into a valley which has significant housing/residential occupation, compared to other potential sites.

Takamatua is a very special valley possibly unique on the peninsula and should be the last place to be disrupted by major infrastructure/sewage works.

Thank you for taking the time to respond. Please include you contact details over the page.

1049

Submission form continued

Contact details

Contact name RHETT MASON.

Organisation name (if representing) /

Contact address

Postcode

Phone number (day) Phone number (evening)

Email (if applicable)

Signature Date 24. 4. 17

fold fold

Do you wish to present your submission at the hearing? Please tick one of the boxes below:

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☐ Yes – I/We would like to be heard

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Submission form

haveyoursay
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- **Option 5 – Disposal via a new outfall pipeline to the mid-harbour**

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Fundamentally, what environment would you prefer Akaroa wastewater is discharged into?

- [x] Irrigation of reclaimed water to trees or pasture
- [ ] Disposal via a new outfall pipeline to the mid-harbour
- [ ] Other (please describe)

Please state your reasons why: I do not like the idea of disposal into Akaroa Harbour. It is an anachronism.

Please rate the options listed below with a number according to your preference, with 1 being your most preferred option and 5 your least preferred option (please note the options below are in no particular order).

- [3] Option 1 – Irrigation of trees or pasture in Robinsons Bay
- [1] Option 2 – Irrigation of trees or pasture at Pompeys Pillar
- [4] Option 3 – Irrigation of trees or pasture in Takamātua Valley, in combination with another area
- [2] Option 4 – Non-potable reuse in Akaroa, in combination with another option
- [5] Option 5 – Disposal via a new outfall pipeline to the mid-harbour
- [ ] Other (please describe)

Please state your reasons for this ranking: I favour irrigation of land at a remote site so that it does not affect local residents, regardless of cost. Options 1 & 3 do not seem fair on residents of those Bays

Continued overleaf

Would you be more supportive of spray irrigation of treated wastewater to pasture or drip irrigation to trees? Please state your reasons why:

No real preference between these two options. Both acceptable practice.

Do you have a preference for the location of reclaimed water storage pond(s)? Please state your reasons why:

No. All options outlined are acceptable. Would favour the closest to the treatment plant at top of Old Ferry Road on cost basis.

Do you think the Council should add aspirational projects to the Akaroa wastewater scheme (e.g. fire storage ponds, providing a reticulated wastewater scheme in Takamātua Valley)? If so, which ones do you support and why?

No. Cost is prohibitive

Do you have any other comments? (Please use additional paper if required):

NO.

Thank you for taking the time to respond. Please include you contact details over the page.

1052

Submission form continued

Contact details

Contact name Richard Graham

Organisation name (if representing)

Contact address

Postcode

Phone number (day) Phone number (evening)

Email (if applicable)

Signature Date 23/4/2017

fold fold

Do you wish to present your submission at the hearing? Please tick one of the boxes below:

Please note that deputations will not be permitted at the meeting where the Council makes its decision.

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Fundamentally, what environment would you prefer Akaroa wastewater is discharged into?

- [x] Irrigation of reclaimed water to trees or pasture
- [ ] Disposal via a new outfall pipeline to the mid-harbour
- [ ] Other (please describe)

Please state your reasons why: Absorption into the ground for use by plants will fully address the problem of disposal of the wastewater.

Please rate the options listed below with a number according to your preference, with 1 being your most preferred option and 5 your least preferred option (please note the options below are in no particular order).

- [4] Option 1 – Irrigation of trees or pasture in Robinsons Bay
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- [4] Option 3 – Irrigation of trees or pasture in Takamātua Valley, in combination with another area
- [3] Option 4 – Non-potable reuse in Akaroa, in combination with another option
- [5] Option 5 – Disposal via a new outfall pipeline to the mid-harbour
- [1] Other (please describe) Irrigation of trees to create a new forest (closer to Akaroa) – see attachment

Please state your reasons for this ranking:

option 5 – this option is not available after the (court) decision.
options 1 and 3 – too much opposition by residents/property owners
option 4 – expensive engineering for a partial solution
option 2 – expensive engineering

Continued overleaf

Would you be more supportive of spray irrigation of treated wastewater to pasture or drip irrigation to trees? Please state your reasons why:

Drip irrigation to trees provides the most effective + efficient means to get water to plant root system, directly with little/no evaporation, and with no 'spray drift'.

Do you have a preference for the location of reclaimed water storage pond(s)? Please state your reasons why:

Do you think the Council should add aspirational projects to the Akaroa wastewater scheme (e.g. fire storage ponds, providing a reticulated wastewater scheme in Takamātua Valley)? If so, which ones do you support and why?

Do you have any other comments? (Please use additional paper if required):

I wish to propose an alternative use of the wastewater — to irrigate a new forest. All wastewater to be used for this enables substantial forest development.

Please refer to attachment detailing this proposal.

Thank you for taking the time to respond. Please include you contact details over the page.

Gmail

Wastewater disposal proposal

1 message

24 April 2017 at 17:20

Use Akaroa wastewater to create a native forest asset which provides income and other benefits. 24April2017

In the proposed options, Akaroa wastewater disposal on land would involve the use of the water to irrigate either pasture or trees.
The options mentioning irrigation to trees do not seem to discuss the benefits of this.

The free availability of the wastewater offers a clear opportunity to create a new forest, which builds a long term asset yielding income and other benefits.

Given the District scheme prohibits plantation (exotic) forestry, then a native forest could be created to take up all the wastewater.

Such a forest would best be placed as close as possible to Akaroa, preferably on the waterside, but well away from homes.
(the scrubland evident on the peninsula along from Children's Bay suggests one possible location).

Pros.

1. The forest could take all the wastewater, eliminating the need for allocation to other options.
2. the forest would become a visitor attraction, the flora and fauna especially the birdlife would be a visitor drawcard.
3. The forest could be walled off to prevent entry by rats/possums/stoats etc. as is done in a few other places in NZ, so creating such a valuable asset for Canterbury, an authentic primeval original environment.
4. Voluntary labour could be available for care of the forest.
5. The forest presents solid research and development interests for academic study - eg. of tree selection, care and growth and birdlife studies.
6. Concerns raised by local residents and others about the 5 options would be removed.
7. The original character of the Akaroa area was native forest with abundant birdlife, something we lost with settlement and the passage of time. If such a forest was established and protected then Akaroa and Canterbury would have a new visitor attraction, a sustainable and permanent one.
8. The forest would be an educational asset, for study and enjoyment use by schools and others.
9. The forest could claim carbon credits which can be used as an income source.
10. The trees could be sustainably milled, as is done elsewhere in NZ, providing more income to offset maintenance costs.
11. Government assistance to forest establishment is possible.
12. Such a forest presents other income-earning possibilities, enhancing the value of the forest to ratepayers eg. a visitor facilities centre.

Cons.

1. Getting land for the forest could be a significant cost.

Queries.

1. Have the project parties (Chch CC et al), discussed the use of the wastewater for tree growth enhancement with ecologists eg.Hugh Wilson ?

2. Might not existing native forest areas in the catchments for the Grehan/Balguerie/Aylmers streams take up the wastewater ?

3.Have landowners been canvassed for this option of establishment of a native forest ?

1052

1053

Submission form continued

Contact details

Contact name IAN WOODHAM

Organisation name (if representing) _____

Contact address _____

_____

_____ Postcode _____

Phone number (day) _____ Phone number (evening) _____

Email (if applicable) _____

Signature I. D. Woodham Date _____

fold fold

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Fundamentally, what environment would you prefer Akaroa wastewater is discharged into?

- [ ] Irrigation of reclaimed water to trees or pasture
- [x] Disposal via a new outfall pipeline to the mid-harbour
- [ ] Other (please describe)

Please state your reasons why:

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- [x] Option 5 – Disposal via a new outfall pipeline to the mid-harbour
- [ ] Other (please describe)

Please state your reasons for this ranking: because its the cheapest and only option

Continued overleaf

Would you be more supportive of spray irrigation of treated wastewater to pasture or drip irrigation to trees? Please state your reasons why:

NO

Do you have a preference for the location of reclaimed water storage pond(s)? Please state your reasons why:

Do you think the Council should add aspirational projects to the Akaroa wastewater scheme (e.g. fire storage ponds, providing a reticulated wastewater scheme in Takamātua Valley)? If so, which ones do you support and why?

Do you have any other comments? (Please use additional paper if required):

Thank you for taking the time to respond. Please include you contact details over the page.

1054

Submission form continued

Contact details

Contact name PATRICIA DART

Organisation name (if representing)

Contact address

Postcode

Phone number (day)

Phone number (evening)

Email (if applicable)

Signature Patricia Dart Date 27.04.2017

fold fold

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Fundamentally, what environment would you prefer Akaroa wastewater is discharged into?

- [ ] Irrigation of reclaimed water to trees or pasture
- [ ] Disposal via a new outfall pipeline to the mid-harbour
- [x] Other (please describe)

Please state your reasons why: I am against waste water being discharged into the harbour. It would be different if it was the open sea. Irrigation of trees/pasture would be more acceptable. Reuse would be the best and most sustainable option

Please rate the options listed below with a number according to your preference, with 1 being your most preferred option and 5 your least preferred option (please note the options below are in no particular order).

- [ ] Option 1 – Irrigation of trees or pasture in Robinsons Bay
- [2] Option 2 – Irrigation of trees or pasture at Pompeys Pillar
- [ ] Option 3 – Irrigation of trees or pasture in Takamātua Valley, in combination with another area
- [1] Option 4 – Non-potable reuse in Akaroa, in combination with another option
- [ ] Option 5 – Disposal via a new outfall pipeline to the mid-harbour
- [ ] Other (please describe)

Please state your reasons for this ranking:
In an area subject to drought the additional water available for reuse by the local community is a benefit which should be utilised.

Continued overleaf

Would you be more supportive of spray irrigation of treated wastewater to pasture or drip irrigation to trees? Please state your reasons why:

Irrigation to trees as this is more a year round procedure. If native trees are planted that particularly suit native birds this would be a great added bonus.

Do you have a preference for the location of reclaimed water storage pond(s)? Please state your reasons why:

A pond near the waste water plant would be the ideal situation as it would be close to Akaroa for reuse.

Do you think the Council should add aspirational projects to the Akaroa wastewater scheme (e.g. fire storage ponds, providing a reticulated wastewater scheme in Takamātua Valley)? If so, which ones do you support and why?

Yes. As Akaroa now takes some of its water from Takamatua valley to use waste water for fire ponds or reticulation seems highly commendable.

Do you have any other comments? (Please use additional paper if required):

I am particularly against using the Takamatua Valley for storage ponds/ irrigation. This valley is unique on the Peninsula as being particularly beautiful and very sheltered from the southerly. It doesn't have enough land for irrigation not to seriously affect those living in the valley, which also has a very diverse biodiversity. There are not many valleys like Takamatua/Robinsons Bay in the Akaroa Harbour and they should be treasured.

Thank you for taking the time to respond. Please include you contact details over the page.

I think it important at this stage that the filtration of the waste water is of the highest standard so that in the longer term future Akaroa will have options, if the scheme comes under over loading pressures, and not have to go back to basics for a remedy -

Submission No: 1055

CHRISTCHURCH CITY COUNCIL
Akaroa Wastewater Scheme

- Received via Have Your Say -

Submissions close 5pm, 30 April 2017

Full Name*:	Hanne LeLievre
Contact Address*:	
Postcode:	
Telephone number:	
Email Address:	
Date Sent:	5/1/2017 12:36:18 PM
Would you like to attend the hearings for this consultation?	No
I am completing this submission:	For myself
Role within Organisation	
Group/Organisation Names	Paul LeLievre
How many people do you represent?	
Preferred environment for Akaroa wastewater discharge:	Other
If Other, please describe and state reasons	I would like to see all wastewater treated and reused. In the interim I would except harbour outfall The used water should be regarded as a re souse not waste. It needs to be treated so it becomes a re souse.
Option 1	Please select
Option 2	Please select
Option 3	Please select
Option 4	Option 4 - Non-potable reuse in Akaroa, in combination with another option
Option 5	Please select
Option 6	Please select
Other	
State reasons for ranking	
Would you be more supportive of spray irrigation of treated wastewater to pasture? Why	

Do you have location preference? Why:	
Should Council add aspirational projects to the Akaroa wastewater scheme?	
Any other comments?	

Submission No: 1060

CHRISTCHURCH CITY COUNCIL
Akaroa Wastewater Scheme

- Received via Have Your Say -

Submissions close 5pm, 30 April 2017

Full Name*:	Sylvia McAslan
Contact Address*:	
Postcode:	
Telephone number:	
Email Address:	
Date Sent:	5/1/2017 1:15:30 PM
Would you like to attend the hearings for this consultation?	Yes
I am completing this submission:	For myself
Role within Organisation	
Group/Organisation Names	
How many people do you represent?	
Preferred environment for Akaroa wastewater discharge:	Other
If Other, please describe and state reasons	I support Beneficial Re-use in Akaroa. Along with an allowance for reclaimed water to be treated to potable standards. Water scarcity (worldwide) due to increased population and climate change means the re-use of water will become necessary. This shows a care and respect for this valuable resource. A project of this cost and lifespan must be forward looking.
Option 1	Option 4 - Non-potable reuse in Akaroa, in combination with another option
Option 2	Other (please describe)
Option 3	Please select
Option 4	Please select
Option 5	Please select
Option 6	Please select
Other	The associated option I support in combination with Option 4 is Transitional Harbour Outfall. While this is not ideal for Ngāi Tahu or the Harbour, it is the most economical option, and enables the strongest 'beneficial re-use in Akaroa' option to be implemented promptly. Thereby achieving removal of effluent from the Harbour.

State reasons for ranking	Beneficial re-use of reclaimed water in Akaroa will provide much sought after water to Akaroa during the busiest and driest summer season, and as a consequence reduce the pressure on the potable water supply. Over time it is likely to make people more aware of their own water use. That includes 'water in' and 'water out', currently not a common awareness. If endorsed by the Christchurch City Council, the principle of efficient water use and re-use will demonstrate awareness, and respect for this limited water resource.
Would you be more supportive of spray irrigation of treated wastewater to pasture? Why	Only at Pompeys Pillar, but this is a very expensive and as yet uncommitted option. I understand the farmer prefers spray irrigation. At the other sites in Robinsons Bay and Takamātua there are too many property owners and residents who would be unreasonably and detrimentally affected.
Do you have location preference? Why:	I support Pond site 10, covered to avoid added water during rain/snow, and to avoid odour and midges given proximity to residences and to avoid fouling before re-use in Akaroa. This site allows gravity feed of reclaimed water back into Akaroa. This site is across the road from the WWTP therefore the affected landowners and residents are already impacted.
Should Council add aspirational projects to the Akaroa wastewater scheme?	I support aspirational projects. Specifically the allowance for when treatment options enable reclaimed water to be treated to potable standards. This is talked about around the world now, but social acceptability or necessity is yet to allow it.
Any other comments?	In 30 years or so when I move into Akaroa it would be very satisfying to know I can have a good and productive garden to potter in, and that water is used wisely. It would also be very satisfying to know that the community and the Christchurch City Council had been able to work together to provide a forward looking, long term economically, environmentally and culturally relevant solution to the current Akaroa Wastewater management issue.

Submission form continued

1061

Contact details

Contact name Mary McNatt.

Organisation name (if representing)

Contact address

Postcode

Phone number (day)

Phone number (evening)

Email (if applicable)

Signature M.E McNatt. Date 26/4/2017.

fold

Do you wish to present your submission at the hearing? Please tick one of the boxes below:

Please note that deputations will not be permitted at the meeting where the Council makes its decision.

☐ Yes – I/We would like to be heard

☑ No – I/We do not want to be heard

No anonymous submissions/feedback will be accepted.

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FREEPOST Authority No.178

Christchurch City Council

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Attention: Hearings Team
Akaroa Wastewater Scheme
Christchurch City Council
PO Box 73016
Christchurch Mail Centre
Christchurch 8154

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Submission form

haveyoursay
www.ccc.govt.nz/haveyoursay

PLEASE READ BEFORE COMPLETING YOUR SUBMISSION

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- **Option 1 – Irrigation of trees or pasture in Robinsons Bay**
- **Option 2 – Irrigation of trees or pasture at Pompeys Pillar**
- **Option 3 – Irrigation of trees or pasture in Takamātua Valley, in combination with another area**
- **Option 4 – Non-potable re-use in Akaroa, in combination with another option**
- **Option 5 – Disposal via a new outfall pipeline to the mid-harbour**

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  Christchurch City Council
  PO Box 73016
  Christchurch Mail Centre
  Christchurch 8154
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Consultation closes on Sunday 30 April 2017

Fundamentally, what environment would you prefer Akaroa wastewater is discharged into?

- [x] Irrigation of reclaimed water to trees or pasture
- [ ] Disposal via a new outfall pipeline to the mid-harbour
- [ ] Other (please describe)

Please state your reasons why: _____

Please rate the options listed below with a number according to your preference, with 1 being your most preferred option and 5 your least preferred option (please note the options below are in no particular order).

- [4] Option 1 – Irrigation of trees or pasture in Robinsons Bay
- [3] Option 2 – Irrigation of trees or pasture at Pompeys Pillar
- [5] Option 3 – Irrigation of trees or pasture in Takamātua Valley, in combination with another area
- [1] Option 4 – Non-potable reuse in Akaroa, in combination with another option
- [2] Option 5 – Disposal via a new outfall pipeline to the mid-harbour
- [ ] Other (please describe)

Please state your reasons for this ranking:

1) Akaroa could easily use this water for irrigation.
2) If the treated water is of high quality
4/5). Valleys too wet to absorb water.

Continued overleaf

Would you be more supportive of spray irrigation of treated wastewater to pasture or drip irrigation to trees? Please state your reasons why:

Drip irrigation is less abrasive & water is absorbed slowly at a regular rate.

Do you have a preference for the location of reclaimed water storage pond(s)? Please state your reasons why:

I do wonder why proposed pond at Takamatua is on well farmed land, when there is poor land on the other side of the road closer to proposed treatment plant.

Do you think the Council should add aspirational projects to the Akaroa wastewater scheme (e.g. fire storage ponds, providing a reticulated wastewater scheme in Takamātua Valley)? If so, which ones do you support and why?

I think the idea of a purple pipe for future residential use should be ~~as aspiration~~ goal for the future.

Do you have any other comments? (Please use additional paper if required):

Thank you for taking the time to respond. Please include you contact details over the page.

1062

Submission form continued

Contact details

Contact name Ken Paulin

Organisation name (if representing)

Contact address

Postcode

Phone number (day)

Phone number (evening)

Email (if applicable)

Signature

Date 26/4/17

fold fold

Do you wish to present your submission at the hearing? Please tick one of the boxes below:

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Christchurch City Council
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Christchurch Mail Centre
Christchurch 8154

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Submission form

haveyoursay
www.ccc.govt.nz/haveyoursay

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  Akaroa Wastewater Scheme
  Christchurch City Council
  PO Box 73016
  Christchurch Mail Centre
  Christchurch 8154
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Consultation closes on Sunday 30 April 2017

Fundamentally, what environment would you prefer Akaroa wastewater is discharged into?

- [ ] Irrigation of reclaimed water to trees or pasture
- [ ] Disposal via a new outfall pipeline to the mid-harbour
- [x] Other (please describe)

Please state your reasons why: Non-potable reuse in Akaroa, with a back up discharge to the harbour

Please rate the options listed below with a number according to your preference, with 1 being your most preferred option and 5 your least preferred option (please note the options below are in no particular order).

- [4] Option 1 – Irrigation of trees or pasture in Robinsons Bay
- [2] Option 2 – Irrigation of trees or pasture at Pompeys Pillar
- [5] Option 3 – Irrigation of trees or pasture in Takamātua Valley, in combination with another area
- [1] Option 4 – Non-potable reuse in Akaroa, in combination with another option
- [3] Option 5 – Disposal via a new outfall pipeline to the mid-harbour
- [ ] Other (please describe)

Please state your reasons for this ranking: The effluent should be used where it is of use, or highly treated and discharged to the sea.

Continued overleaf

Would you be more supportive of spray irrigation of treated wastewater to pasture or drip irrigation to trees? Please state your reasons why:

Do you have a preference for the location of reclaimed water storage pond(s)? Please state your reasons why:

Across Old Coach Rd from the treatment site is the only site

Do you think the Council should add aspirational projects to the Akaroa wastewater scheme (e.g. fire storage ponds, providing a reticulated wastewater scheme in Takamātua Valley)? If so, which ones do you support and why?

Do you have any other comments? (Please use additional paper if required):

Thank you for taking the time to respond. Please include you contact details over the page.

I support the Friends of Banks Peninsula in its submission, with the following variations. Funds need to be spent producing a very high quality effluent which can be utilized on gardens in Akaroa , as well as the public uses proposed.

I do not support the short term disposal at Pompeys Pillar.

As a short term option the mid harbor disposal should be installed. This would need to be well monitored, and reported on. Also meet very stringent requirements.

Long term the plan must be to store and reticulate all the effluent within Akaroa. However the harbour outfall will need to be retained as an emergency disposal. This may not be considered acceptable, but I put it to you that it is better to have a controlled monitored emergency discharge, than a land disposal option in a valley, which if overloaded due to many variables, will end up as uncontrolled discharge into the sensitive mud flats of the harbor.

1063

Submission form continued

Contact details

Contact name Grant Robertson.

Organisation name (if representing) _____

Contact address _____

_____

_____ Postcode _____

Phone number (day) _____ Phone number (evening) _____

Email (if applicable) _____

Signature Grant Robertson Date 25 / 4 / 17

fold fo

Do you wish to present your submission at the hearing? Please tick one of the boxes below:

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Attention: Hearings Team
Akaroa Wastewater Scheme
Christchurch City Council
PO Box 73016
Christchurch Mail Centre
Christchurch 8154

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Submission form

haveyoursay
www.ccc.govt.nz/haveyoursay

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Fundamentally, what environment would you prefer Akaroa wastewater is discharged into?

- ☐ Irrigation of reclaimed water to trees or pasture
- ☐ Disposal via a new outfall pipeline to the mid-harbour
- ☑ Other (please describe)

Please state your reasons why: Akaroa should use there own wastewater.

Please rate the options listed below with a number according to your preference, with 1 being your most preferred option and 5 your least preferred option (please note the options below are in no particular order).

- ☐ Option 1 – Irrigation of trees or pasture in Robinsons Bay
- ☐ Option 2 – Irrigation of trees or pasture at Pompeys Pillar
- ☐ Option 3 – Irrigation of trees or pasture in Takamātua Valley, in combination with another area
- ☑ Option 4 – Non-potable reuse in Akaroa, in combination with another option
- ☐ Option 5 – Disposal via a new outfall pipeline to the mid-harbour
- ☐ Other (please describe)

Please state your reasons for this ranking: Because Akaroa is always short of water. for gardens etc.

Continued overleaf

Would you be more supportive of spray irrigation of treated wastewater to pasture or drip irrigation to trees? Please state your reasons why:

No I don't agree with it going onto pasture or trees on farm land effecting stock and seepage to Water ways.

Do you have a preference for the location of reclaimed water storage pond(s)? Please state your reasons why:

I do not want ponds on any farm land

Do you think the Council should add aspirational projects to the Akaroa wastewater scheme (e.g. fire storage ponds, providing a reticulated wastewater scheme in Takamātua Valley)? If so, which ones do you support and why?

Yes they should use treated water for toilets etc.

Do you have any other comments? (Please use additional paper if required):

Waste water ponds would devalue properties in Robinsons Bay and Takamatua,

Thank you for taking the time to respond. Please include you contact details over the page.

1064

Submission form continued

Contact details

Contact name ALYSON ARIGG

Organisation name (if representing)

Contact address

Postcode

Phone number (day)

Phone number (evening)

Email (if applicable)

Signature Alyson Grigg Date 26-04-2017

fold fold

Do you wish to present your submission at the hearing? Please tick one of the boxes below:

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Attention: Hearings Team
Akaroa Wastewater Scheme
Christchurch City Council
PO Box 73016
Christchurch Mail Centre
Christchurch 8154

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27 APR 2017
Akaroa Service Centre
Chch City Council

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Submission form

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Fundamentally, what environment would you prefer Akaroa wastewater is discharged into?

- ☐ Irrigation of reclaimed water to trees or pasture
- ☐ Disposal via a new outfall pipeline to the mid-harbour
- ☒ Other (please describe)

Please state your reasons why: Please refer to copy of submission attached from John Baker

Please rate the options listed below with a number according to your preference, with 1 being your most preferred option and 5 your least preferred option (please note the options below are in no particular order).

- ☐ Option 1 – Irrigation of trees or pasture in Robinsons Bay
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- ☐ Option 4 – Non-potable reuse in Akaroa, in combination with another option
- ☐ Option 5 – Disposal via a new outfall pipeline to the mid-harbour
- ☐ Other (please describe)

Please state your reasons for this ranking:

Continued overleaf

Would you be more supportive of spray irrigation of treated wastewater to pasture or drip irrigation to trees? Please state your reasons why:

Do you have a preference for the location of reclaimed water storage pond(s)? Please state your reasons why:

Do you think the Council should add aspirational projects to the Akaroa wastewater scheme (e.g. fire storage ponds, providing a reticulated wastewater scheme in Takamātua Valley)? If so, which ones do you support and why?

Do you have any other comments? (Please use additional paper if required):

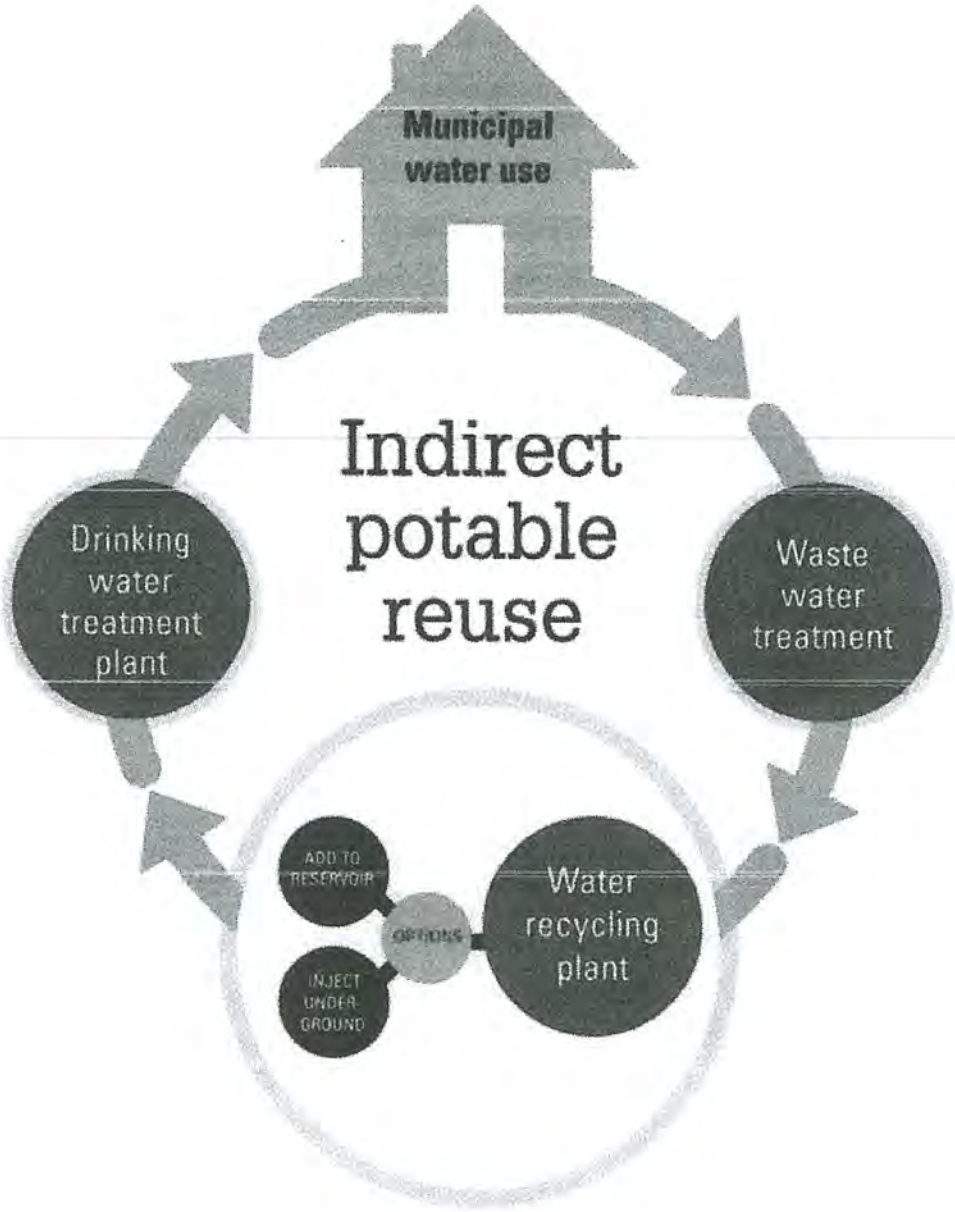
I fully endorse all points made by John Baker! I urge all of you from CCC involved in studying the question of Akaroa's waste-water to forever any further study of how to "dispose" of the wastewater. Instead please concentrate on how best to put it to beneficial use. You owe it to future generations not to waste this opportunity!

Thank you for taking the time to respond. Please include you contact details over the page.

AKAROA SEWAGE AND WASTEWATER BENEFICIAL RECYCLING PROJECT SUBMISSION TO CHRISTCHURCH CITY COUNCIL

APRIL 25 2017

John Baker



THE PERFECT CIRCLE FROM MOTHER EARTH AND BACK
AKAROA HARBOUR HAS A CLEAN GREEN PURE AND SUSTAINABLE NATURAL WATER SUPPLY
REPLACE WHAT WE TAKE FROM MOTHER EARTH
NO EFFLUENTS SENT TO OUR FOOD SOURCES
NO EFFLUENTS SENT TO OUR LAND SURFACES

AKAROA SEWAGE AND WASTEWATER BENEFICIAL RECYCLING PROJECT SUBMISSION TO CCC

APRIL 2017

Our Akaroa Harbour community needs are simple:

1. **We need more drinking water. (Akaroa currently has seasonal water restrictions)**
2. **We need to convince the World Public (not just Akaroa) that our water is "Natural" and "Pure". Those two words are "very" important and have distinct meanings.**
3. **We need to make our Sewage "disappear" in the most "Cost Effective" and environmentally friendly manner possible.**
4. **We need to cease dumping any waste products directly or indirectly into our water ways or onto our land surfaces to convince Kiwis and the world that we truly are "Clean and Green" and find a natural recycling process that we can be proud of.**

The solution for Akaroa is simple:

1. **Collect sewage and waste waters. (Via existing sewer pipes)**
2. **Primary filtration via a new collection and pumping station to be built at the North end of Akaroa.**
3. **Pump the primary filtered water to a secondary processing plant to produce water of high quality (possibly potable) to new facilities to be built on Old Coach Road.**
4. **Pump the processed water to "Recharge the Natural Aquifer of water held by the Basaltic Rock formation" that feeds our "Natural Streams and Springs. This technology is named "MAR" Managed Aquifer Recharging. Sometimes named as Managed Artificial Recharging. MAR is already being practised in NZ and we have many good reference sites including Canterbury.**
5. **Collect and pump the "Natural Water" from the traditional Springs and Streams to the existing water treatment reservoir on L'Aube Hill ready for final sterilization and polishing by the existing plant to produce "Pure and Natural Potable Water."**
6. **Reticulate the "Pure and Natural" resource water through the existing domestic water system without restrictions.**

BACKGROUND

The Technology to convert sewage to potable water has been around since the sixties. The technology has increased dramatically since then and there are many examples of successfully operating systems around the Globe that perform more efficiently with much less capital and running costs than the original systems.

We are now asking "If the answer is so simple and cost effective then why are Kiwis so insistent on ignoring the technology?" WHY? WHY? WHY? The answer is incredibly simple!! We don't like the "thought" of recycling sewage. We don't like knowing the source of the water that has been so recycled regardless of the fact that there are millions of people around the Globe in places like London, New York, San Diego, Orange County and Namibia et al that have been drinking recycled sewage for decades without any issues.

The "Good News" for Akaroa residents is that we now have the technology that can make the "bad thoughts" disappear and achieve all of our "Needs". The answer is "Managed Aquifer Recharging of Mother Earth"! MARME!! Perfect!!

BENEFITS

1. **If we process all our waste water products back into our Aquifers after they have been "processed", we constantly "stock up" the existing water volume that is naturally stored there. Instead of just taking the water out and eventually wasting and "dumping" it we can return the water to where it came from in a complete "Cycle" preventing natural springs from drying up. As a bonus we could even see more springs pop up? There will be no more water restrictions and we can future proof population growth in the area.**

2. **If we drink water that is coming from our natural aquifers in a natural and pure form it does not create any bad thoughts. Instead we will be proud of how we manage our water resources and we will be happy to tell the World about it.**

3. **We do not need to build an expensive secondary water reticulation system called "Pink Pipes" that are returning "impure water" to our land surfaces for irrigation or effluent disposal.**

4. **We do not have to "compulsory buy" massive areas of private land to irrigate with "impure water" close to existing residents homes.**

5. **We do not have to endure massive property "devaluations" due to original CCC proposals.**

6. **We do not have to discharge "anything" impure into our long harbour or the offshore seawaters ever again!!**

7. **Akaroa Harbour residents will at last be able to keep an "honest face" when they tell the world that we are "clean and green". The CCC health department water test results will prove that we are in fact "Clean Green Natural and Pure"!!**

8. **The tourism benefits are endless. Akaroa can lead NZ into a new era just like it did being the first Town in NZ to produce "Free Electricity" from hydro power!!!!**

9. **The health benefits are huge. We can finally take Shellfish and Seafoods with total confidence from our harbour, and our kids can swim in the sea 365 days of the year. Our sea life Dolphins, Seals, Penguins and Birds et al will have more chance of growing with us into the future.**

10. **Our Maori Iwi will breathe a huge sigh of relief when they realise that Pakeha are finally listening to what they have been saying about fouling local food sources with excrement effluent for one hundred and seventy seven years and disrespecting their Tapu (Takapuneke) site close to and including Onuku.**

PROPOSED CCC ACTION PLAN

- **CCC Councillors, Engineers and their Consultants must adopt a positive "Mind Set" that follows the basic principles of recycling. We cannot continue to take and not give back. The days of dumping effluents are over! Our old habits and stupid beliefs are actually killing us and our planet. It is time for change! Now!!!!**
- **CCC must rethink and delay any confirmation of the current proposals that are on the table until this submission research has been totally exhausted and the results being confirmed as feasible or discarded.**
- **Akaroa needs Hydrologist and Geologist Specialists Engineers to assess the feasibility of this submission. We have those people here in Canterbury. They are specialists and are already "Recharging" the Canterbury Plains in much the same manner this submission outlines. We need to get those people into Akaroa with a positive mind set that will find the best answers and best places for recharging. It may be that we have to build "Artificial Recharging Sites" in the form of artificial wetlands or drilled holes that will connect with the Volcanic sub strata. Be aware that an "Aquifer" is any sub surface material that will absorb and store water like a sponge. Our natural Akaroa Volcanic Aquifers have been recharging themselves for thousands of years. Basalt is an incredibly hard rock but because of the way it is formed from molten rock being hit by cold air and cold water on eruption it is "fractured" and "layered" like a sponge. That sponge has been providing the water for Akaroa ever since Akaroa Harbour volcanically burst into life. We only need to find the best place/s to "recharge" and replace the water that what we are taking.**
- **We need to find the best supplier/s of the technology required. There are many proficient companies in places like USA, Germany and Australia. The Australians may yet be leading the world with the technology as they really need to adopt the concept of recharging fast! Global warming will accelerate those needs in many countries. The water technology is growing at an exponential rate. The Australian Government has given one leading edge company the green light and bag full of money to go the next step up and produce results by 2019 which are based on "Graphene Filtration". Graphene filtration has recently been proven to "desalinate seawater". Regardless of which system is adopted for Akaroa in 2017, it must be capable of being easily upgradeable to all new future technologies as they come on stream. If Akaroa recycles all of its waste water and still runs dry in the future, we could yet be pumping sea water (through Graphene) to supplement the natural cycle.**

Acknowledgements:–
To: Ngai Tahu and Onuku Iwi for giving me crystal clear inspiration and motivation. They opened my eyes to realise that "Never before have so many people been so deaf and so stupidly dumb". Thank you for the wake up call!! Please accept my personal apologies for what Pakeha have done to our Akaroa Harbour. I'm so sorry!! I truly hope the CCC can realise that they also need to formally apologise for what happened in Takapuneke in 1960 when the existing sewage treatment system was built.

To: Friends of Banks Peninsula especially Suky Thompson. Your efforts todate have been utterly remarkable. They gave me the traction, inspiration and energy to continue. Thank you!!

SUPPORT LINKS

http://www.golder.com/en/modules.php?name=News&sp_id=1199&page_id=208
Golder & Associates are local specialists in environmental water engineering.

https://www.theguardian.com/sustainable-business/2015/jan/20/turning-human-waste-into-drinking-water
Bill Gates funds new technology to convert sewage into drinking water for 110,000 person community with no lost energy. Cost US$ 1.5m.

http://blogs.ei.columbia.edu/2011/04/04/from-wastewater-to-drinking-water/
2011 San Diego system: Sewage to drinking water 1,000,000 gallons/day (3,875,000 litres). Current population 1.4m people. US$ 11.90m

http://mena-water.com/home/water-solutions/
German manufacturer of "Loo to Tap" water recycling systems in a shipping container!!

http://www.janickibioenergy.com/news/press/
Janicki Bioenergy Ltd producers of Omniprocessor sewage to drinking water black boxes. 2017 News reports on other applications of interest to NZ mainly farming/dairy.

https://www.ocwd.com/gwrs/
Orange County Water System USA. Recycles water and introduces it back into the aquifers for later pumping to the water reticulation system.

https://water.usgs.gov/ogw/aquiferbasics/volcan.html
Good examples of recharging Volcanic and other "Rock" based aquifers.

https://www.friendsofbp.org.nz/
Akaroa Harbour and Banks Peninsula residents group.

http://www.cleanteq.com/
Leading Australian manufacturer of the latest water cleansing recycling technology.

1066

Submission form continued

Contact details

Contact name JENNIFER GILLANDERS.

Organisation name (if representing) —

Contact address

Postcode

Phone number (day)

Phone number (evening) —

Email (if applicable) —

Signature J. Gillanders. Date 28/4/2017.

fold fold

Do you wish to present your submission at the hearing? Please tick one of the boxes below:

Please note that deputations will not be permitted at the meeting where the Council makes its decision.

☐ ~~Yes – I/We would like to be heard~~

☑ No – I/We do not want to be heard

No anonymous submissions/feedback will be accepted.

fold fold

FREEPOST Authority No.178

Christchurch City Council

Free

Attention: Hearings Team
Akaroa Wastewater Scheme
Christchurch City Council
PO Box 73016
Christchurch Mail Centre
Christchurch 8154

tape here tape here

Submission form

haveyoursay
www.ccc.govt.nz/haveyoursay

PLEASE READ BEFORE COMPLETING YOUR SUBMISSION

The Christchurch City Council is seeking your feedback on the five proposed options for the Akaroa wastewater project:

- **Option 1 – Irrigation of trees or pasture in Robinsons Bay**
- **Option 2 – Irrigation of trees or pasture at Pompeys Pillar**
- **Option 3 – Irrigation of trees or pasture in Takamātua Valley, in combination with another area**
- **Option 4 – Non-potable re-use in Akaroa, in combination with another option**
- **Option 5 – Disposal via a new outfall pipeline to the mid-harbour**

Submissions are public information

Please note: Your full name, address and telephone number are required because this information is important for transparency, and for Christchurch City Council's decision-making process. It also means we can update you on progress. Ideally we would like your email address too, if you have one, as this makes it easier for us to stay in touch with you throughout the engagement process.

Your submission, including your name and contact details, will be made available to the decision-making body, for example the Community Board, Committee and/or Council, to help them make an informed decision.

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How to give us your feedback

You can use this submission form or you can provide your feedback in a number of ways:

- **Online:** You may enter your submission using the online form provided on the Council's website at **ccc.govt.nz/haveyoursay**
- **By email:** akaroawwproject@ccc.govt.nz
  Please make sure your full name and address is included with your submission.
- **By mail (no stamp required):**
  Freepost 178
  Attention: Hearings Team
  Akaroa Wastewater Scheme
  Christchurch City Council
  PO Box 73016
  Christchurch Mail Centre
  Christchurch 8154
- **By hand delivery to:** Civic Offices, 53 Hereford Street, Christchurch or at the drop-in sessions

Consultation closes on Sunday 30 April 2017

Fundamentally, what environment would you prefer Akaroa wastewater is discharged into?

- [ ] Irrigation of reclaimed water to trees or pasture
- [1] Disposal via a new outfall pipeline to the mid-harbour
- [ ] Other (please describe)

Please state your reasons why: low cost into harbour.

Please rate the options listed below with a number according to your preference, with 1 being your most preferred option and 5 your least preferred option (please note the options below are in no particular order).

- [4] Option 1 – Irrigation of trees or pasture in Robinsons Bay
- [2] Option 2 – Irrigation of trees or pasture at Pompeys Pillar
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- [3] Option 4 – Non-potable reuse in Akaroa, in combination with another option
- [1] Option 5 – Disposal via a new outfall pipeline to the mid-harbour
- [ ] Other (please describe)

Please state your reasons for this ranking: 1) low cost (2) Plenty land.
3) In Combination with mid harbour. 4 & 5 To many homes effected.

Continued overleaf

Would you be more supportive of spray irrigation of treated wastewater to pasture or drip irrigation to trees? Please state your reasons why:

Do you have a preference for the location of reclaimed water storage pond(s)? Please state your reasons why:

Do you think the Council should add aspirational projects to the Akaroa wastewater scheme (e.g. fire storage ponds, providing a reticulated wastewater scheme in Takamātua Valley)? If so, which ones do you support and why?

Do you have any other comments? (Please use additional paper if required):

Thank you for taking the time to respond. Please include you contact details over the page.

Submission No: 1067

CHRISTCHURCH CITY COUNCIL
Akaroa Wastewater Scheme

- Received via Have Your Say -

Submissions close 5pm, 30 April 2017

Full Name*:	Jeremy Moore
Contact Address*:	
Postcode:	
Telephone number:	
Email Address:	
Date Sent:	5/1/2017 2:07:22 PM
Would you like to attend the hearings for this consultation?	Yes
I am completing this submission:	For myself
Role within Organisation	
Group/Organisation Names	
How many people do you represent?	
Preferred environment for Akaroa wastewater discharge:	Disposal via a new outfall pipeline to the mid-harbour
If Other, please describe and state reasons	Please see attached my submission
Option 1	Please select
Option 2	Please select
Option 3	Please select
Option 4	Please select
Option 5	Please select
Option 6	Please select
Other	Please see attached my submission.
State reasons for ranking	
Would you be more supportive of spray irrigation of treated wastewater to pasture? Why	

Do you have location preference? Why:	
Should Council add aspirational projects to the Akaroa wastewater scheme?	
Any other comments?	

SUBMISSION 30 April 2017

Akaroa Reclaimed Water Beneficial Reuse, Treatment and Disposal Options

Jeremy Moore

Introduction

1. I have an interest in Akaroa's wastewater treatment and disposal options because my Parents have lived in Robinsons Bay for over 10 years.

2. Their property produces Robinsons Bay Extra Virgin Olive Oil.

3. Robinson's Bay Extra Virgin Olive Oil has been judged the best in New Zealand for 4 of the last 5 years.

4. Robinsons Bay is now internationally recognised for producing exceptional Extra Virgin Olive Oil.

5. Their property is also a very successful Bed & Breakfast, hosting guests from all around the world.

Submission

- I submit that all of the proposed wastewater options in Robinson's Bay are unacceptably close to resident's homes.

- There is a negative stigma associated with living in close proximity to any wastewater treatment (colloquially known as "Pooh Ponds").

- Regardless of the water quality in the ponds or sprinklers, the stigma associated with Robinsons Bay would negatively affect local people, businesses, and property values. This is undeniable, and hugely significant.

- The "pooh pond" stigma would be catastrophic for Robinson's Bay Extra Virgin Olive Oil and the Olive Grove bed and breakfast operation.

Supported Options

I support the options put forward by the Friends of Banks Peninsula Submission. I also support the original proposal put forward by Council that was declined due to cultural effects on Iwi.

1068

Submission form continued

Contact details

Contact name Barbara Sinclair

Organisation name (if representing)

Contact address

Postcode

Phone number (day)

Phone number (evening)

Email (if applicable)

Signature B Sinclair. Date 26th April '17

fold fold

Do you wish to present your submission at the hearing? Please tick one of the boxes below:

Please note that deputations will not be permitted at the meeting where the Council makes its decision.

☐ Yes – I/We would like to be heard

☑ No – I/We do not want to be heard

No anonymous submissions/feedback will be accepted.

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FREEPOST Authority No.178

Christchurch City Council

810-15 27 APR 17 CARRIED BY NZ [illegible] AND POST <<

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>>> GOT A QUESTION? VISIT WWW.NZ[illegible].CO.NZ/[illegible] <<<

tape here tape here

Attention: Hearings Team
Akaroa Wastewater Scheme
Christchurch City Council
PO Box 73016
Christchurch Mail Centre
Christchurch 8154

Submission form

haveyoursay
www.ccc.govt.nz/haveyoursay

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- **Option 3 – Irrigation of trees or pasture in Takamātua Valley, in combination with another area**
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- **Option 5 – Disposal via a new outfall pipeline to the mid-harbour**

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  Attention: Hearings Team
  Akaroa Wastewater Scheme
  Christchurch City Council
  PO Box 73016
  Christchurch Mail Centre
  Christchurch 8154
- **By hand delivery to:** Civic Offices, 53 Hereford Street, Christchurch or at the drop-in sessions

Consultation closes on Sunday 30 April 2017

Fundamentally, what environment would you prefer Akaroa wastewater is discharged into?

- [x] Irrigation of reclaimed water to trees or pasture
- [ ] Disposal via a new outfall pipeline to the mid-harbour
- [x] Other (please describe) Managed Aquifer Recharge of Mother Earth.

Please state your reasons why:

No more waste to go into harbour.

Please rate the options listed below with a number according to your preference, with 1 being your most preferred option and 5 your least preferred option (please note the options below are in no particular order).

- [4] Option 1 – Irrigation of trees or pasture in Robinsons Bay
- [5] Option 2 – Irrigation of trees or pasture at Pompeys Pillar
- [3] Option 3 – Irrigation of trees or pasture in Takamātua Valley, in combination with another area
- [2] Option 4 – Non-potable reuse in Akaroa, in combination with another option
- [ ] Option 5 – Disposal via a new outfall pipeline to the mid-harbour
- [1] Other (please describe) "MARME"

Please state your reasons for this ranking:

As above. Treated water to be used in toilets for washing, gardens. None to go into harbour

Continued overleaf

Would you be more supportive of spray irrigation of treated wastewater to pasture or drip irrigation to trees? Please state your reasons why:

Drip irrigation less obvious.

Do you have a preference for the location of reclaimed water storage pond(s)? Please state your reasons why:

Not in built up areas.
Not in my backyard or any other backyards.

Do you think the Council should add aspirational projects to the Akaroa wastewater scheme (e.g. fire storage ponds, providing a reticulated wastewater scheme in Takamātua Valley)? If so, which ones do you support and why?

I think the council should seriously research MARINE as a realistic alternative.

Do you have any other comments? (Please use additional paper if required):

Time for action is long overdue.
Stop putting it in the "too hard basket".
This problem is not going away & we need to do something NOW. Rates will need to be raised, but this problem belongs to us all and we need to do it once, and do it right.

Thank you for taking the time to respond. Please include you contact details over the page.

1069

Akaroa Wastewater Submission

Murray and Sue, Will and Hanna Johns
Paua Bay Farm Ltd on behalf of the Johns Family Trust

We are submitting our thoughts on the proposed disposal of Akaroa Waste Water at Pompeys Pillar As owners of the land we will be directly affected if the proposal proceeds. We acknowledge that the waste water needs to be disposed of however we have several key concerns that would need to be addressed for this site to be considered an option by the owners.

The following concerns have originated from independent research completed via The Waste Water Working party

1. Nutrient Concerns – particularly Nitrogen, Potassium and Magnesium.

Based on the proposed maximum effluent application rates (330 mm/ha/yr of effluent) and the actual nutrient concentrations from the Duvauchelle scheme (as per presentation by Brett Robinson 16/3/2017).

a. Nitrogen, at the proposed application rate of 270 – 330 mm/ha/year of effluent would be insufficient to sustain additional pasture growth, leaving pastures nitrogen deficient.
b. Soil levels of Potassium and Magnesium are already very high. We have concerns about adding more of these nutrients, particularly on soil structure and animal health. Mitigation may be required in the future.
c. Impact on Nutrient Budget (requirement of ECAN)

If the scheme were to proceed we would need to work through these issues and potential mitigation by the council.

2. Lack of certainty over amount of irrigation.

It needs to be acknowledged that the proposed scheme is designed for effluent disposal rather than as a dedicated irrigation scheme. A dedicated irrigation scheme would be designed to put on perhaps 500 - 600 mm/year where the effluent is designed to put on around 330 mm, essentially meaning the scheme is underspecified for fully effective irrigation. It should be further noted that these specifications are to meet future requirements and are unlikely to deliver this quantity of water in the short term. If water is then also diverted for recycled greywater as proposed then application rates could further decline.

In short the proposed effluent disposal provides only partial irrigation on the proposed area, reducing reliability of pasture production. Further information on irrigation design would be required.

3. Impact on stock Management

While the proposed level of treatment of effluent means that stock would meet existing requirements (providing 48 hour grazing withholding period). There are concerns that should these requirements may over time become so strict that the farm may no longer be able to meet the requirements.

It should be noted that the 48 hour withholding period for grazing will only be manageable if irrigation design is sympathetic. Ie. Irrigation sectors are aligned to paddocks.

4. On Farm Storage Dam

The location and size of the storage dam is a concern. From our calculation the dam may need to be 2 – 3 hectares in size. This consumes a good proportion of the available grazeable area.

5. Impact on future land use

The presence of an effluent disposal system at Pompeys Pillar is likely to have a significant impact on potential future land use. The farm already operates tourism (homestay), and while it should have little impact on this business it does limit the establishment of other tourism opportunities at Pompeys Pillar (eg Walkway, farm tours etc). Effluent disposal and associated easements ia also likely to impact on any potential subdivision of land in the future.

6. Impact on Land Value

The above factors would negatively impact on the potential to sell the property and on land values.

Summary:

Productive increases for the farm are likely to be very limited, however inconvenience and potential downside issues could be considerable.

1071

Submission form continued

Contact details

Contact name W.E.L. OAKLEY

Organisation name (if representing)

Contact address

Postcode

Phone number (day)

Phone number (evening)

Email (if applicable)

Signature W.E.L. Oakley Date 26-4-17

fold fold

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☐ Yes – I/We would like to be heard

☑ No – I/We do not want to be heard only if you're stuck.

No anonymous submissions/feedback will be accepted.

fold fold

FREEPOST Authority No.178

Christchurch City Council

Free

Attention: Hearings Team
Akaroa Wastewater Scheme
Christchurch City Council
PO Box 73016
Christchurch Mail Centre
Christchurch 8154

RECEIVED
27 APR 2017
BY: Emy Cooke
x8133

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Submission form

haveyoursay
www.ccc.govt.nz/haveyoursay

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  Please make sure your full name and address is included with your submission.
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  Attention: Hearings Team
  Akaroa Wastewater Scheme
  Christchurch City Council
  PO Box 73016
  Christchurch Mail Centre
  Christchurch 8154
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Consultation closes on Sunday 30 April 2017

Fundamentally, what environment would you prefer Akaroa wastewater is discharged into?

- [x] Irrigation of reclaimed water to trees or pasture
- [ ] Disposal via a new outfall pipeline to the mid-harbour
- [ ] Other (please describe)

Please state your reasons why: Outfall pipes - old technology and offensive to Maori.

Please rate the options listed below with a number according to your preference, with 1 being your most preferred option and 5 your least preferred option (please note the options below are in no particular order).

- [1] Option 1 – Irrigation of trees or pasture in Robinsons Bay
- [4] Option 2 – Irrigation of trees or pasture at Pompeys Pillar
- [3] Option 3 – Irrigation of trees or pasture in Takamātua Valley, in combination with another area
- [2] Option 4 – Non-potable reuse in Akaroa, in combination with another option
- [5] Option 5 – Disposal via a new outfall pipeline to the mid-harbour
- [ ] Other (please describe)

Please state your reasons for this ranking: Wastewater is a resource to be valued not merely disposed of.

Continued overleaf

Would you be more supportive of spray irrigation of treated wastewater to pasture or drip irrigation to trees? Please state your reasons why:

Favour drip irrigation to trees. I note preference for native species. Trees grow at twice the rate at least with wastewater. Paupo has done this for years. Rather than native species I would favour pinus radiata or Oregon timber trees and harvest them progressively and get some payback.

Do you have a preference for the location of reclaimed water storage pond(s)? Please state your reasons why:

Do you think the Council should add aspirational projects to the Akaroa wastewater scheme (e.g. fire storage ponds, providing a reticulated wastewater scheme in Takamātua Valley)? If so, which ones do you support and why?

Yes but judging from the signs on the main highway Takamatua residents wouldn't appreciate 'it'!

Do you have any other comments? (Please use additional paper if required):

Income from forestry could be spent in the Akaroa area.

1.7m to irrigate the green areas of Akaroa is a very good idea. Excellent way of using a resource

Thank you for taking the time to respond. Please include you contact details over the page.

Submission No: 1073

CHRISTCHURCH CITY COUNCIL
Akaroa Wastewater Scheme

- Received via Have Your Say -

Submissions close 5pm, 30 April 2017

Full Name*:	Suzanne Church
Contact Address*:	
Postcode:	
Telephone number:	
Email Address:	
Date Sent:	5/1/2017 3:59:43 PM
Would you like to attend the hearings for this consultation?	Yes
I am completing this submission:	For myself
Role within Organisation	
Group/Organisation Names	
How many people do you represent?	
Preferred environment for Akaroa wastewater discharge:	Other
If Other, please describe and state reasons	re-use I feel beneficial re-use of the water in Akaroa is the best sustainable option.
Option 1	Option 4 - Non-potable reuse in Akaroa, in combination with another option
Option 2	Please select
Option 3	Please select
Option 4	Please select
Option 5	Please select
Option 6	Please select
Other	
State reasons for ranking	I am in full support of the “Friends of Banks Peninsula” submission, combining re-use with either an interim harbour outfall, irrigation to pasture at Pompeys Pillar or the possibility of ground water recharging, if this proves to be a viable option.
Would you be more supportive of spray irrigation of treated wastewater to pasture? Why	Drip irrigation to trees is preferable but it is not making good use of the water, as it is not really needed by the trees. Spray irrigation is totally unacceptable to me with the issue of spray drift close to houses and waterways and the possible industrialization that could occur in our valley if a cut and carry haymaking option was put in place.

Do you have location preference? Why:	Pond site 10 seems the best site for providing re-use back into the Akaroa township. It is very close to the site of the treatment plant and could also be used if irrigation to Pompeys Pillar was chosen. I would expect the Council to be in good communication with the landowner of this site to negotiate fair and acceptable terms with regards to the use of this location.
Should Council add aspirational projects to the Akaroa wastewater scheme?	A fire fighting pond seems a wise use of a storage pond. Fire is a real threat in our area and the often difficult terrain makes fighting a fire a huge challenge. At this stage I see a reticulated wastewater scheme in Takamatua just compounding the proble
Any other comments?	I would like to see the Christchurch City Council take the initiative and introduce voluntary re-use of the wastewater, treated to the highest possible quality, as a solution. Re-use has the potential to reduce and possibly eliminate water shortages in the township, commits the local community to a more sustainable approach to their waste, and reduces the land requirements that other potential schemes would require. This idea, alongside initiatives from the Council to encourage water conservation, and the continuation of the work that is being done to eliminate stormwater from the sewerage system, would seem a very beneficial solution to a difficult and controversial problem. I understand that re-use can only be workable with another option in place initially, and I support the idea of combining it with harbour outfall as an interim measure, or irrigation to an area when it is wanted and has a beneficial effect, such as Pompeys Pillar. The possibility of ground water recharging could also be an environmentally sound option for the excess water. I would like to see a robust and sustainable solution put in place that is guaranteed to be resilient and fail safe, that is ecologically sound, and eliminates health and environmental risks. I would want the scheme to be introduced in a staged fashion, with very thorough analysis done of each step to ensure the reliability and safety of the system. A detailed analysis of the public health risks would also be expected. I find the consultation document difficult to respond to as it has no real plans described for each option, with no clarity given about a specific solution within each proposed idea. The document seemed very slanted towards the Robinsons Bay option, with the map showing large areas of available land, even though some of that land in actually the sites of bores, bogs, banks and water supplies. If the Council had approached landowners first they would have found out these things, and should not have included these areas or properties on their map. My personal response is mainly with regard to the option of Robinsons Bay, the Valley where I live. I feel it is a great risk to suggest land application on such challenging and difficult terrain and I do not support wastewater disposal in Robinsons Bay. This Bay does not need regular irrigation and just because there is a willing seller in the Bay does not mean that it should be seen as an easy solution by the Council to use that land for what could become no more than an experiment. The poorly draining soil, fragipans it contains and low infiltration capacity once the soil is saturated already causes slips, runoff and flooding, and the thought of extra water being added to our catchment is very concerning. In heavy rain the creek next to our house turns into a raging torrent, which can burst its banks and flood the surrounding paddocks. The water pours off the hillsides and the creek forms new rivers. To tell us that it would be beneficial to have extra water in our Valley proves that little research or investigation has been done into the reality of our situation. Our home is situated on the Valley floor and the consultation document map shows a possible large pond on the boundary of our 7 acre property, irrigation marked on every boundary fence surrounding us on every side, with irrigation marked on half of our land as well! We find the prospect of this scheme could have a huge impact on life as we know it and can hardly be called a fair or well considered solution. It was upsetting that the Council had not informed us that our property was earmarked for possible irrigation, and we only discovered this when we received the consultation document in the mail. The list of concerns I have regarding the Robinsons Bay option is large: operational breakdowns causing contamination, unacceptable boundary setbacks from houses and waterways, the visual impact large ponds would have, the industrialisation and noise involved with possible cut and carry hay making, insects, midges, smell, nitrogen build-up, contaminants in the water, microplastic pollution, contamination of bores and water supplies, earthquake risks, tsunami risks, noise pollution, pollution of our whitebaiting stream, contamination of our swimming beach, unstability of land and riverbanks with extra water application, possible re-contouring of the land, and the effect on our food production and current farming practises. In severe flooding the creek

	bursts its banks and runs down the road, effecting houses down by the seashore. Extra water added to our catchment would only compound this problem. The wellbeing of my family and community are important to me and I see this beautiful pristine environment and the lifestyle we are able to live here drastically affected if this scheme goes ahead. It will devalue our property and possibly make it unsalable, as others in the Valley are already finding since rumours of this scheme have been circulating.The stigma that would be attached to our Bay would leave it a very unattractive option to potential buyers, and no compensation appears to be available to possible affected parties. The possibility of irrigation to native bush just seems a way for the Council to try and justify dumping the wastewater in our Valley. Native bush does not need a lot of watering to become established, and we have been given only a vague overview of the the possible types of plantings that might be used. I am concerned that the irrigation levels could exceed what the plants can absorb, leading to ponding, dieback of vegetation, and the ultimate failure of the scheme. Any scheme the Council puts in place needs to be carefully managed with robust maintenance and repair procedures. There is a general feeling of mistrust among the community of the Councils ability to maintain this project adequately and the 'whole of life' costings quoted for Robinsons Bay tend to indicate that very few resources will be put in maintaining the project over the years. There is also mistrust surrounding the Duvauchelle wastewater scheme, and the possibility that Robinsons Bay could be considered an easy disposal field for that scheme in years to come. Our community highly values the historical significance of our Bay, with the Pavitt cottage and mill site considered one of central focuses of valley life. I am totally opposed to the thought of a large pond being situated close by to the cottage, risking and impacting the amenity of that part of the valley. Our own property is also significant, being one of the first parcels of land to be purchased in the Bay, and some of the fruit and nut trees planted by the early settlers are still producing a harvest today. We value the rural lifestyle that we have chosen here and hope that the Council will work hard at avoiding a mess that future generations may have to clean up. I do not feel that Takamatua is suitable for any scheme either, as it faces many of the same issues as Robinsons Bay. I am in full support of the "Friends of Banks Peninsula" submission and the constructive and innovative ideas they have put forward. Water is a valuable resource and I implore the Council to lead the way and set up a scheme that we can all be proud of, with ideas and innovations that other Councils around the country can implement due to it's successful outcome.

1094

Submission form continued

Contact details

Contact name Charilynn Wright

Organisation name (if representing)

Contact address

Postcode

Phone number (day) Phone number (evening)

Email (if applicable)

Signature CRWright Date 25.4.17

fold fold

Do you wish to present your submission at the hearing? Please tick one of the boxes below:

Please note that deputations will not be permitted at the meeting where the Council makes its decision.

- [x] Yes – I/We would like to be heard
- [ ] No – I/We do not want to be heard

No anonymous submissions/feedback will be accepted.

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FREEPOST Authority No.178

Christchurch City Council

Free

Attention: Hearings Team
Akaroa Wastewater Scheme
Christchurch City Council
PO Box 73016
Christchurch Mail Centre
Christchurch 8154

RECEIVED
- 1 MAY 2017
Akaroa Service Centre
Chch City Council

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Submission form

haveyoursay
www.ccc.govt.nz/haveyoursay

PLEASE READ BEFORE COMPLETING YOUR SUBMISSION

The Christchurch City Council is seeking your feedback on the five proposed options for the Akaroa wastewater project:

- **Option 1 – Irrigation of trees or pasture in Robinsons Bay**
- **Option 2 – Irrigation of trees or pasture at Pompeys Pillar**
- **Option 3 – Irrigation of trees or pasture in Takamātua Valley, in combination with another area**
- **Option 4 – Non-potable re-use in Akaroa, in combination with another option**
- **Option 5 – Disposal via a new outfall pipeline to the mid-harbour**

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  Please make sure your full name and address is included with your submission.
- **By mail (no stamp required):**
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  Attention: Hearings Team
  Akaroa Wastewater Scheme
  Christchurch City Council
  PO Box 73016
  Christchurch Mail Centre
  Christchurch 8154
- **By hand delivery to:** Civic Offices, 53 Hereford Street, Christchurch or at the drop-in sessions

Consultation closes on Sunday 30 April 2017

Fundamentally, what environment would you prefer Akaroa wastewater is discharged into?

- [ ] Irrigation of reclaimed water to trees or pasture
- [x] Disposal via a new outfall pipeline to the mid-harbour
- [ ] Other (please describe)

Please state your reasons why: _____

Please rate the options listed below with a number according to your preference, with 1 being your most preferred option and 5 your least preferred option (please note the options below are in no particular order).

- [4] Option 1 – Irrigation of trees or pasture in Robinsons Bay
- [3] Option 2 – Irrigation of trees or pasture at Pompeys Pillar
- [5] Option 3 – Irrigation of trees or pasture in Takamātua Valley, in combination with another area
- [2] Option 4 – Non-potable reuse in Akaroa, in combination with another option
- [1] Option 5 – Disposal via a new outfall pipeline to the mid-harbour
- [ ] Other (please describe)

Please state your reasons for this ranking: _____

Continued overleaf

Would you be more supportive of spray irrigation of treated wastewater to pasture or drip irrigation to trees? Please state your reasons why:

Neither

Do you have a preference for the location of reclaimed water storage pond(s)? Please state your reasons why:

No but have it where it maybe needed for FIRE

Do you think the Council should add aspirational projects to the Akaroa wastewater scheme (e.g. fire storage ponds, providing a reticulated wastewater scheme in Takamātua Valley)? If so, which ones do you support and why?

Do you have any other comments? (Please use additional paper if required):

Please read attached

Thank you for taking the time to respond. Please include you contact details over the page.

28/04/17

Hello my name is Cherilynn Wright married to John Wright I have lived in Akaroa for 45 years and recently in our mail box we got a drop off from Christchurch City Council

Re - Akaroa Reclaimed Water Beneficial Reuse, Treatment and Disposal Options

"Have your say"

This is the first time I have had my say as in a submission.

I read through the proposals put forward by the council looked at the maps to find that our property was to be used as a Dripper Potential Irrigation site I am appalled we had never been contacted and were never asked could you go onto our property under no circumstances do any Council staffs enter without consent have you heard of Health & Safety? I was contacted on a Sunday afternoon after the publication (not good enough). Our property was not brought to become a Midge site the value of our property will decrease and with any decrease it will not reflect in the rates that I know for a fact having experienced. The site is slip prone I have family living in the cottage on the site Grandsons that play in the Gully and build tree huts where you intend to drip or irrigate. Christchurch City Council took over Banks Peninsula Council warts and all and have had years to get this sorted you take the Cruise ship money when looking around our untidy town I see not too much has been returned. I have to wonder if some of the berth age money from these Ships was put into a water sewerage fund for Akaroa. You have made changes to the Akaroa wharf so people coming into the town from the cruise ship are catered for you have allowed tourism to take over that's great if you have the infrastructures to deal with the tourist but you haven't. We have a scooter park my grandchildren have enjoyed and still do a Play centre my granddaughter attends fantastic how much cost is that to the council? That mighty Council has resource consent for a seven metre high terminal pumping station to collect waste in an area that could affect both of these the waste stinks. Driving into beautiful Akaroa you will see that building and the many camper vans that hang in the area, they should be in camping grounds. As a rate payer can I ask why we have got to the point where you are being forced to make a decision you have known for years that water and sewerage are a problem in Akaroa.

We have a lot of wonderful local people working for you in Akaroa time you city people got your act together and in a business manner spoke to the rate payers you intend to make decisions about their properties.

I expect any public meetings in future on the matter of sewerage to be held in Akaroa with plenty of advertising.

Submission No: 1096

CHRISTCHURCH CITY COUNCIL
Akaroa Wastewater Scheme

- Received via Have Your Say -

Submissions close 5pm, 30 April 2017

Full Name*:	Brent Schulz
Contact Address*:	
Postcode:	
Telephone number:	
Email Address:	
Date Sent:	5/2/2017 9:03:39 AM
Would you like to attend the hearings for this consultation?	Yes
I am completing this submission:	For myself
Role within Organisation	
Group/Organisation Names	
How many people do you represent?	
Preferred environment for Akaroa wastewater discharge:	Disposal via a new outfall pipeline to the mid-harbour
If Other, please describe and state reasons	
Option 1	Please select
Option 2	Please select
Option 3	Please select
Option 4	Please select
Option 5	Please select
Option 6	Please select
Other	
State reasons for ranking	
Would you be more supportive of spray irrigation of treated wastewater to pasture? Why	

Do you have location preference? Why:	
Should Council add aspirational projects to the Akaroa wastewater scheme?	
Any other comments?	I donot want the wastewater drip[ped or irrigated to any valley due to the soil types and high rainfall areas. loss of land value, Fly issue!!! loss of amenities, loss of sun ie if trees were planted close to residential area. If the council proceed with the option of growing native plants there is a serious fungal plant disease called Myrtle rust that effects Kanuka, Manuka, Pohutukawa and Rata and eucalyptus fejoa. This has been found on Raoul Island north of NZ and spread by weather events. This would limit the plant options that the council is proposing .

1097

Submission form continued

Contact details

Contact name Chris Bray

Organisation name (if representing) –

Contact address

Postcode

Phone number (day)

Phone number (evening)

Email (if applicable)

Signature C Bray Date 28-4-2017

fold fold

Do you wish to present your submission at the hearing? Please tick one of the boxes below:

Please note that deputations will not be permitted at the meeting where the Council makes its decision.

☐ Yes – I/We would like to be heard

☑ No – I/We do not want to be heard

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FREEPOST Authority No.178

Christchurch City Council

Free

Attention: Hearings Team
Akaroa Wastewater Scheme
Christchurch City Council
PO Box 73016
Christchurch Mail Centre
Christchurch 8154

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28 APR 2017
Akaroa Service Centre
Chch City Council

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Submission form

haveyoursay
www.ccc.govt.nz/haveyoursay

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  Christchurch City Council
  PO Box 73016
  Christchurch Mail Centre
  Christchurch 8154
- **By hand delivery to:** Civic Offices, 53 Hereford Street, Christchurch or at the drop-in sessions

Consultation closes on Sunday 30 April 2017

Fundamentally, what environment would you prefer Akaroa wastewater is discharged into?

- [x] Irrigation of reclaimed water to trees or pasture
- [ ] Disposal via a new outfall pipeline to the mid-harbour
- [ ] Other (please describe)

Please state your reasons why: _____

Please rate the options listed below with a number according to your preference, with 1 being your most preferred option and 5 your least preferred option (please note the options below are in no particular order).

- [ ] Option 1 – Irrigation of trees or pasture in Robinsons Bay
- [2] Option 2 – Irrigation of trees or pasture at Pompeys Pillar
- [ ] Option 3 – Irrigation of trees or pasture in Takamātua Valley, in combination with another area
- [1] Option 4 – Non-potable reuse in Akaroa, in combination with another option
- [ ] Option 5 – Disposal via a new outfall pipeline to the mid-harbour
- [ ] Other (please describe)

Please state your reasons for this ranking: _____

Continued overleaf

Would you be more supportive of spray irrigation of treated wastewater to pasture or drip irrigation to trees? Please state your reasons why:

Yes using the purple pipe irrigation System.

Do you have a preference for the location of reclaimed water storage pond(s)? Please state your reasons why:

Yes No 10 on Takamatua Map on Paper Road Further away from residential areas ~~and~~

Do you think the Council should add aspirational projects to the Akaroa wastewater scheme (e.g. fire storage ponds, providing a reticulated wastewater scheme in Takamātua Valley)? If so, which ones do you support and why?

Do you have any other comments? (Please use additional paper if required):

Thank you for taking the time to respond. Please include you contact details over the page.

1098

Submission form continued

Contact details

Contact name Peter & Elizabeth Haylock

Organisation name (if representing)

Contact address

Postcode

Phone number (day) Phone number (evening)

Email (if applicable)

Signature E Haylock Date 28-4-2017

fold fold

Do you wish to present your submission at the hearing? Please tick one of the boxes below:

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FREEPOST Authority No.178

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  Akaroa Wastewater Scheme
  Christchurch City Council
  PO Box 73016
  Christchurch Mail Centre
  Christchurch 8154
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Fundamentally, what environment would you prefer Akaroa wastewater is discharged into?

- [ ] Irrigation of reclaimed water to trees or pasture
- [x] Disposal via a new outfall pipeline to the mid-harbour
- [ ] Other (please describe)

Please state your reasons why: We know stock will not do as well on pasture that has been irrigated with reclaimed water

Please rate the options listed below with a number according to your preference, with 1 being your most preferred option and 5 your least preferred option (please note the options below are in no particular order).

- [5] Option 1 – Irrigation of trees or pasture in Robinsons Bay
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- [5] Option 3 – Irrigation of trees or pasture in Takamātua Valley, in combination with another area
- [1] Option 4 – Non-potable reuse in Akaroa, in combination with another option
- [1] Option 5 – Disposal via a new outfall pipeline to the mid-harbour
- [ ] Other (please describe)

Please state your reasons for this ranking: Irrigation is not an option we think is the right one

Continued overleaf

Would you be more supportive of spray irrigation of treated wastewater to pasture or drip irrigation to trees? Please state your reasons why:

No. we have seen the evidence of ~~forest~~ Pasture that is irrigated South of Ashburton & Burnham and it is not producing good stock

Do you have a preference for the location of reclaimed water storage pond(s)? Please state your reasons why:

Pond No 1 Subject to landowners approval Can be well screened and is close to plant. Must be covered.

Do you think the Council should add aspirational projects to the Akaroa wastewater scheme (e.g. fire storage ponds, providing a reticulated wastewater scheme in Takamātua Valley)? If so, which ones do you support and why?

We do not think the council has really looked at any aspirational projects with any depth and of cause they should look

Do you have any other comments? (Please use additional paper if required):

Thank you for taking the time to respond. Please include you contact details over the page.

1099

Submission form continued

Contact details

Contact name Averil parthonnaud.

Organisation name (if representing)

Contact address

Postcode

Phone number (day) Phone number (evening)

Email (if applicable)

Signature Date 24/4/17.

fold fold

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- ☐ Irrigation of reclaimed water to trees or pasture
- ☐ Disposal via a new outfall pipeline to the mid-harbour
- ☑ Other (please describe)

Please state your reasons why: beneficial reuse back into Akaroa by purple pipes.

Please rate the options listed below with a number according to your preference, with 1 being your most preferred option and 5 your least preferred option (please note the options below are in no particular order).

NO → ☐ Option 1 – Irrigation of trees or pasture in Robinsons Bay
2 Option 2 – Irrigation of trees or pasture at Pompeys Pillar
NO → ☐ Option 3 – Irrigation of trees or pasture in Takamātua Valley, in combination with another area
1 Option 4 – Non-potable reuse in Akaroa, in combination with another option
3 Option 5 – Disposal via a new outfall pipeline to the mid-harbour
☐ Other (please describe)

Please state your reasons for this ranking: 1- is the most sustainable solution. and not wasteful of a valuable resource.
2- because it may have an actual beneficial reuse with grazing stock or crop planting.
3- because it is the most culturally sensitive to the people of akaroa township and Robinsons bay and Takamatea.

Continued overleaf

Would you be more supportive of spray irrigation of treated wastewater to pasture or drip irrigation to trees? Please state your reasons why:

rather drip to trees- because spray can blow in the wind. and the proposed sites are so close to people's houses. But would prefer none of the above due to the Rotorua drip to trees irrigation scheme has failed and it's so scary to think pollutants could be dripped so close to our fruit trees.

Do you have a preference for the location of reclaimed water storage pond(s)? Please state your reasons why:

Above Akaroa next to treatment plant, it seems the most logical place to use back in to the town.

Do you think the Council should add aspirational projects to the Akaroa wastewater scheme (e.g. fire storage ponds, providing a reticulated wastewater scheme in Takamātua Valley)? If so, which ones do you support and why?

yes - attatched is some examples pg. 3

Do you have any other comments? (Please use additional paper if required):

yes please read my attatched page 1 and 2

Thank you for taking the time to respond. Please include you contact details over the page.

I am not supportive of spray irrigation to pasture at all in the proposed sites in Robinsons bay and am not supportive of drip irrigation to trees so close to people's houses and gardens, I am not supportive of a giant pond or ponds in the bay either.

I don't believe there is any benefit to have this happen in Robinsons bay or Takamatua.

During the big storms that we recently had it was flooded in the paddock across the road from us and almost flooding the back yard of Pavitt cottage the historic cottage of Robinsons bay. It rained heavily for only one night.

This paddock is one of the proposed sites for pasture irrigation; I stood in this water 24 hours after it had stopped raining and the water in some places were up to the top of my gumboot. All the ground was squishy and there where puddles everywhere, all the water during the storm was making little streams that were finding their way to the main stream which had turned into a raging river. The land here can only take so much water until it makes its own way to our streams. I have now seen it with my own eyes. That's going straight out to sea. It totally defeats the whole purpose. One freak storm in summer if we had irrigators here would mean good bye Pavitt cottage. And the Church family down the road had the same problem with their place; another proposed site is next to their home.

Our vege garden and fruit trees are in between one proposed site and the stream. When we bought our house two years ago our plan was to create a food forest on our bottom section, organically grow our own produce. Won't all our trees and garden suck up this wastewater as it travels though to seep out into the stream? Walnut trees have a huge root radius up to 19 metres for just an average walnut tree. Our trees were planted by the early settlers of Banks Peninsula; they are huge, not average. Walnut tree roots seek out nutrient rich water and grow towards it, they also pick up Heavy metals and pathogens such as Escherichia coli and Enterobacter spp, which will leave the fruits (Nuts) unsafe to eat. If the water is not treated to a drinkable quality we may get sick.

Walnut trees have very aggressive root systems they will search out this water which would be full of nitrates, over time, maybe years yes, but there is a chance of these trees sucking up all this dumped water and going the same ways as the trees at the land disposal site in Rotorua. They are all dying; they had sucked up to many nitrates to remain healthy over time. It took 20 years yes, but even though the council is saying they will not be dumping as much water it could still happen maybe in 30 years, the build up over time could have an effect, which as far as I know the city council has not thought of what effects this could have on all these specific trees, walnut trees, willow, cypress and fruit trees so close to irrigation zones. Every Forum I have read online says do not plant any of these trees close to wastewater irrigation areas. Also on the map of Robinsons bay study area there is no buffer zone marks for our bottom section where our garden and trees are, yes our house is 25 meters away but not the food we eat. Surely our food gardens should have buffer zones? Especially if the city council says it's not to be used on salad crops, or raw food crops.

We sell these Nuts and many of our neighbours do too.

One of the reasons we bought the property was the Walnut trees, Friends and family come to visit and pick up walnuts together. Every time my 87 years old grandma comes to visit she's out there picking up nuts, she loves walnuts, we eat them every day for breakfast It's so fun feeling like you

can live off the land, the trees are our main view and it would be devastating if the city council ended up Killing them like the trees in Rotorua.

Robinsons Bay is a peaceful beautiful valley with neighbours that became fast friends, the first week we arrived they had organise everyone in the valley for a morning tea to welcome us.

We fell in love with this place, we chose it for the tranquil setting and major bonus it was not so far from Akaroa where we work, also the road down the bay is perfect for jogging and taking our 3 year old daughter for a walk and play on her tricycle, we got into a habit now she can only take her afternoon nap if we push her down the road in the pushchair. Could this still happen when, next to the road, is where spray irrigators could be working? On windy days wouldn't the spray be going everywhere, would we have to wear rain coats and have to put up with irrigator noise every time we went for a stroll, Would there be tractors always operating cutting pasture? Industrial noise? Busy road?

The odd sound of pukekos fighting, a random "moo" from a cow, a babbling brook, bird song, meeting your neighbour on the road walking their dog and having a chat in the middle of it. This is life in Robinsons bay, It's like we live in the good old days, this is where we wanted to raise our family, we invested all our money and dreams into our property fixing up what was a bit of a wreck when we bought it, spending many hours D.I.Ying the house where we planned to grow old in, we love this valley. It's perfect.

This proposed dumping of the wastewater will destroy the beauty and culture of this amazing valley, it's a paradise and it's almost like that song pave paradise and put up a parking lot. But worse, flood paradise and turn it into a noisy dumping ground with out of place sewage ponds.

The stigma of this has already dropped house prices, and if worst comes to worst and it goes wrong we would never be able to sell.

More than anything I'm worried about the tranquillity of this bay, losing its culture, will people still want to walk along the Robinsons bay road pick apples, pears, Walnuts and black berries for pies and jam making, could we still eat the water cress out of the stream, could people still go white baiting, can people still collect sea grass from the beach. Would people still want to drive here to walk their dogs as many do because it is one of the best long flat roads around, wouldn't you be worried your dog might jump the fence and get covered in waste water? All our neighbours running Bed and Breakfasts would go out of business if their guests had to see a sewage pond out of their window, and deal with the smell and noise.

It's really depressing and heart breaking this valley is being considered and pushed as the best solution because it might be the cheapest, changing our way of life, using our paradise as nothing but a dumping ground.

What's the point? Don't we need to think of the future when Akaroa has water issues? If the water was treated to a drinkable standard like they do in orange county California, I wouldn't mind having a purple pipe solution. We would use it in our shop in Akaroa. This I believe is the best solution, it helps everybody. Create a botanic feature garden using this water, actually be truthful to the 100% Pure NZ we believe we are. New Zealand is way behind the times; let our council pave the way,

starting here for a more sustainable future, Akaroa could be the gem in Canterbury's crown, something for all Canterbrian's to be proud of.

Please consider our cultural values too. We chose this land to raise our daughter and possible future child in the best environment possible for our values. Robinsons bay Valley is a special, historic, peaceful, beautiful place, and everyone who lives here thinks the same, we just want to protect something that is still unique in this changing world and push for the most sustainable solution which could benefit many.

I think the council should think to add some aspiration projects to the Akaroa waste water scheme.

Fire storage ponds are a great idea to have them tucked away all over the place, especially in our forest reserves. Discreetly placed off the main road, hidden by nice plantings or trees? Ready for when needed.

Use the water to fill up fire trucks, have a big tank at the fire station connected by purple pipes to the big storage tank?

Use the water to fill up street cleaning trucks and clean streets with it?

Use it in the commercial laundry mat in Akaroa?

Create a botanical garden in Akaroa, at the Heritage Park or by Stanley Park. Close to Takapuneke, this area which is owned by the council, it would be a nice walk along the waterfront to get to a botanical garden.

Have ponds and constructed wetlands in this garden, plant lilies and water flowers, have a bio sculpture water feature. Jackie Brookner is an artist who creates bio sculptures than cleans storm waters and recycles it in the design. Moss and vegetation help the process, it's pretty too.

It could be a major tourist attraction to bring people to the Canterbury region and look how 100% pure NZ really is. Have a donation box at the entrance for local conservation projects.

It would be nice to have a boat wash and car wash down near the rec ground.

If it was treated to a drinkable quality have a camper van fill up station so they could take the water away, using it for their showers and toilets.

Here's some far reaching ideas.

Sell the water to other countries that need water? You never know... if it's a drinkable quality. And I know Christchurch city council is trying to sell our fresh water to overseas investors who want bottled water. But yeah this is not very sustainable.

On the outer coast like Pompey's pillar grow crops for bio fuel or hemp plants or bamboo to make sustainable clothing?

Scientists are working on water powered cars. In the next 20 years this may exist, water will become even more precious as a fuel.

1100

Submission form continued

Contact details

Contact name Kathrini Fraser

Organisation name (if representing)

Contact address

Postcode

Phone number (day)

Phone number (evening)

Email (if applicable)

Signature Kathrini Fraser Date 30/4/17.

Do you wish to present your submission at the hearing? Please tick one of the boxes below:

Please note that deputations will not be permitted at the meeting where the Council makes its decision.

☑ Yes – I/We would like to be heard

☐ No – I/We do not want to be heard

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FREEPOST Authority No.178

Christchurch City Council

Free

Attention: Hearings Team
Akaroa Wastewater Scheme
Christchurch City Council
PO Box 73016
Christchurch Mail Centre
Christchurch 8154

RECEIVED
- 1 MAY 2017
Akaroa Service Centre
Chch City Council

Submission form

haveyoursay
www.ccc.govt.nz/haveyoursay

PLEASE READ BEFORE COMPLETING YOUR SUBMISSION

The Christchurch City Council is seeking your feedback on the five proposed options for the Akaroa wastewater project:

- **Option 1 – Irrigation of trees or pasture in Robinsons Bay**
- **Option 2 – Irrigation of trees or pasture at Pompeys Pillar**
- **Option 3 – Irrigation of trees or pasture in Takamātua Valley, in combination with another area**
- **Option 4 – Non-potable re-use in Akaroa, in combination with another option**
- **Option 5 – Disposal via a new outfall pipeline to the mid-harbour**

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  Please make sure your full name and address is included with your submission.
- **By mail (no stamp required):**
  Freepost 178
  Attention: Hearings Team
  Akaroa Wastewater Scheme
  Christchurch City Council
  PO Box 73016
  Christchurch Mail Centre
  Christchurch 8154
- **By hand delivery to:** Civic Offices, 53 Hereford Street, Christchurch or at the drop-in sessions

Consultation closes on Sunday 30 April 2017

Fundamentally, what environment would you prefer Akaroa wastewater is discharged into?

- [ ] Irrigation of reclaimed water to trees or pasture
- [ ] Disposal via a new outfall pipeline to the mid-harbour
- [x] Other (please describe)

Please state your reasons why:

I was hoping for something new & innovative. I thought maybe we could burn the residue & make power and then make a biosphere heated with the waste & water with the water. A great tourist attraction ie The eden project.

Please rate the options listed below with a number according to your preference, with 1 being your most preferred option and 5 your least preferred option (please note the options below are in no particular order).

Rank	Option
5	Option 1 – Irrigation of trees or pasture in Robinsons Bay
4	Option 2 – Irrigation of trees or pasture at Pompeys Pillar
6	Option 3 – Irrigation of trees or pasture in Takamātua Valley, in combination with another area
3	Option 4 – Non-potable reuse in Akaroa, in combination with another option
2	Option 5 – Disposal via a new outfall pipeline to the mid-harbour
1	Other (please describe) – See above.

Please state your reasons for this ranking:

See above

Continued overleaf

Would you be more supportive of spray irrigation of treated wastewater to pasture or drip irrigation to trees? Please state your reasons why:

Non of the above at this stage

Do you have a preference for the location of reclaimed water storage pond(s)? Please state your reasons why:

No. 1.

Do you think the Council should add aspirational projects to the Akaroa wastewater scheme (e.g. fire storage ponds, providing a reticulated wastewater scheme in Takamātua Valley)? If so, which ones do you support and why?

why would it you use the sea. !!!

Do you have any other comments? (Please use additional paper if required):

yes. !. Please Come back when you have fully done your home work on this.....

Thank you for taking the time to respond. Please include you contact details over the page.

1101

Submission form continued

Contact details

Contact name M D + K FRASER

Organisation name (if representing) "COOMBE" – FARM / B+B.

Contact address

Postcode

Phone number (day)

Phone number (evening)

Email (if applicable)

Signature

Date 27/4/17.

Do you wish to present your submission at the hearing? Please tick one of the boxes below:

Please note that deputations will not be permitted at the meeting where the Council makes its decision.

☐ Yes – I/We would like to be heard

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FREEPOST Authority No.178

Christchurch City Council

Free

Attention: Hearings Team
Akaroa Wastewater Scheme
Christchurch City Council
PO Box 73016
Christchurch Mail Centre
Christchurch 8154

RECEIVED
- 1 MAY 2017
Akaroa Service Centre
Chch City Council

Submission form

haveyoursay
www.ccc.govt.nz/haveyoursay

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- **Option 1 – Irrigation of trees or pasture in Robinsons Bay**
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  Akaroa Wastewater Scheme
  Christchurch City Council
  PO Box 73016
  Christchurch Mail Centre
  Christchurch 8154
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Consultation closes on Sunday 30 April 2017

Fundamentally, what environment would you prefer Akaroa wastewater is discharged into?

- [ ] Irrigation of reclaimed water to trees or pasture
- [x] Disposal via a new outfall pipeline to the mid-harbour
- [x] Other (please describe) Non potable re-use in Akaroa

Please state your reasons why: Initially re-used in Akaroa with the excess being returned via a pipe to harbour mouth then released on out going tide.

Please rate the options listed below with a number according to your preference, with 1 being your most preferred option and 5 your least preferred option (please note the options below are in no particular order).

- [ ] Option 1 – Irrigation of trees or pasture in Robinsons Bay
- [ ] Option 2 – Irrigation of trees or pasture at Pompeys Pillar
- [ ] Option 3 – Irrigation of trees or pasture in Takamātua Valley, in combination with another area
- [1] Option 4 – Non-potable reuse in Akaroa, in combination with another option
- [2] Option 5 – Disposal via a new outfall pipeline to the mid-harbour
- [ ] Other (please describe)

Please state your reasons for this ranking: Options 1, 2, 3 have too much of an impact on the inhabitants & enviroment of areas. Which are the gateway to the township of Akaroa

Continued overleaf

Would you be more supportive of spray irrigation of treated wastewater to pasture or drip irrigation to trees? Please state your reasons why:

No neither - both being applied to land that is not suitable to the volumes of waste water being applied. Other problems unpalatable grass for livestock + attraction of birds + insects.

Do you have a preference for the location of reclaimed water storage pond(s)? Please state your reasons why:

No need for storage ponds - tanks for potable re-use when these tanks full then pumped to harbour mouth pipe line ~~[illegible]~~ ~~[illegible]~~ + discharged on outgoing tide.

Do you think the Council should add aspirational projects to the Akaroa wastewater scheme (e.g. fire storage ponds, providing a reticulated wastewater scheme in Takamātua Valley)? If so, which ones do you support and why?

- Meter all users on water scheme, would lower amount of water needed to be treated
- The council has been short sighted + missed an opportunity to do something innovative

Do you have any other comments? (Please use additional paper if required):

- Waste could be used to generate gas or heat fuelling hot pools, ice rinks, hot air ballons
- Biosphere heated by gas, water by waste water growing plants + used as a tourist attraction
- Turn waste water into Walnut Wine or Dolphin Beer - now there's an idea!

Thank you for taking the time to respond. Please include you contact details over the page.

1102

Submission form continued

Contact details

Contact name Richard & Jill Simpson

Organisation name (if representing)

Contact address

Postcode

Phone number (day) Phone number (evening)

Email (if applicable)

Signature Date 27/4/17

fold fold

Do you wish to present your submission at the hearing? Please tick one of the boxes below:

Please note that deputations will not be permitted at the meeting where the Council makes its decision.

- [x] Yes – I/We would like to be heard
- [ ] No – I/We do not want to be heard

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FREEPOST Authority No.178

Christchurch City Council

810-15 28 APR 17 CARRIED BY NEW ZEALAND POST

>>> GOT A QUESTION? VISIT ... Free

tape here tape here

Attention: Hearings Team
Akaroa Wastewater Scheme
Christchurch City Council
PO Box 73016
Christchurch Mail Centre
Christchurch 8154

Submission form

haveyoursay
www.ccc.govt.nz/haveyoursay

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  Akaroa Wastewater Scheme
  Christchurch City Council
  PO Box 73016
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Consultation closes on Sunday 30 April 2017

Fundamentally, what environment would you prefer Akaroa wastewater is discharged into?

- ☐ Irrigation of reclaimed water to trees or pasture
- ☑ Disposal via a new outfall pipeline to the mid-harbour
- ☐ Other (please describe)

Please state your reasons why: Concerned that long term use of land for disposal will lead to eventual concentration of contaminants in soil

Please rate the options listed below with a number according to your preference, with 1 being your most preferred option and 5 your least preferred option (please note the options below are in no particular order).

- [3] Option 1 – Irrigation of trees or pasture in Robinsons Bay
- [5] Option 2 – Irrigation of trees or pasture at Pompeys Pillar
- [4] Option 3 – Irrigation of trees or pasture in Takamātua Valley, in combination with another area
- [2] Option 4 – Non-potable reuse in Akaroa, in combination with another option
- [1] Option 5 – Disposal via a new outfall pipeline to the mid-harbour
- ☐ Other (please describe)

Please state your reasons for this ranking: Would prefer a disposal system that is not soil based.

Continued overleaf

Would you be more supportive of spray irrigation of treated wastewater to pasture or drip irrigation to trees? Please state your reasons why:

No spray dispersal as will be a problem in our high wind zones.
Prefer drip irrigation to trees

Do you have a preference for the location of reclaimed water storage pond(s)? Please state your reasons why:

Corner of Long Bay & Coach Rd.
Close to treatment plant.

Do you think the Council should add aspirational projects to the Akaroa wastewater scheme (e.g. fire storage ponds, providing a reticulated wastewater scheme in Takamātua Valley)? If so, which ones do you support and why?

Support reticulated treatment in Takamatua.

Do you have any other comments? (Please use additional paper if required):

We oppose storage ponds at Pompeys Pillar
We are concerned that some of the proposals for land based dispersal would cause long term problems for the areas surrounding Akaroa
We particularly oppose the expense of disposal to more distant sites as on going expenses for rate payers. We are afraid of the "out of sight out of mind" senario for Pompeys Pillar
We are close neighbours to Pompeys pillar. Our garden and house are a very short distance away. We have a garden tourism business which relies on a pristine natural environment.

Thank you for taking the time to respond. Please include you contact details over the page.

1103

Submission form continued

Contact details

Contact name PAT LYONS

Organisation name (if representing)

Contact address

Postcode

Phone number (day) Phone number (evening)

Email (if applicable)

Signature Patricia Lyons Date 27.4.17.

fold fold

Do you wish to present your submission at the hearing? Please tick one of the boxes below:

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Christchurch City Council

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Christchurch City Council
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Submission form

haveyoursay
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Consultation closes on Sunday 30 April 2017

Fundamentally, what environment would you prefer Akaroa wastewater is discharged into?

- ☐ Irrigation of reclaimed water to trees or pasture
- ☐ Disposal via a new outfall pipeline to the mid-harbour
- ☑ Other (please describe)

Please state your reasons why: Beneficial re-use of the water in Akaroa

Please rate the options listed below with a number according to your preference, with 1 being your most preferred option and 5 your least preferred option (please note the options below are in no particular order).

- ☐ Option 1 – Irrigation of trees or pasture in Robinsons Bay
- ☐ Option 2 – Irrigation of trees or pasture at Pompeys Pillar
- ☐ Option 3 – Irrigation of trees or pasture in Takamātua Valley, in combination with another area
- ☑ Option 4 – Non-potable reuse in Akaroa, in combination with another option
- ☐ Option 5 – Disposal via a new outfall pipeline to the mid-harbour
- ☐ Other (please describe)

Please state your reasons for this ranking: Makes use of scarce resource in Akaroa, avoids pumping & dumping to area where water is not required. Supports long term sustainable waste water m'ment in area it is created.

Continued overleaf

Would you be more supportive of spray irrigation of treated wastewater to pasture or drip irrigation to trees? Please state your reasons why:

Neither

Do you have a preference for the location of reclaimed water storage pond(s)? Please state your reasons why:

Agree with Friends of Banks Peninsula submission and Rebuncans Bay Ratepayers and Residents Association submission.

Do you think the Council should add aspirational projects to the Akaroa wastewater scheme (e.g. fire storage ponds, providing a reticulated wastewater scheme in Takamātua Valley)? If so, which ones do you support and why?

As above

Do you have any other comments? (Please use additional paper if required):

It is disappointing that CCC have developed proposal to drop waste water from one community onto another. This is an antiquated way of dealing with the problem. It is not a forward thinking sustainable approach and at odds with NZ clean & green image. The unknowns are far too great to makes decisions — look at issue of Bromley Plant - still plagued by midges - and CCC don't know what to do. I visit Rebuncans Bay fortnightly through Spring, Summer & Autumn and have local, NZ and overseas visitors with me. It is a beautiful place — why spoil it with poor decision making? I have several friends in Takamatua and visit the valley regularly. I am shocked at the heavy handed tactics of CCC & Beca in threatening residents to either agree to the holding ponds or have their land compulsory acquired. I think the CCC has forgotten who employs its staff and should be treating residents in more consultative & respectful way from the start.

after 10 years

Thank you for taking the time to respond. Please include you contact details over the page.

1104

Submission form continued

Contact details

Contact name Neil + Rebecca Barnett

Organisation name (if representing)

Contact address

Postcode

Phone number (day)

Phone number (evening)

Email (if applicable)

Signature [signature] Date 29 April 2017

fold fold

Do you wish to present your submission at the hearing? Please tick one of the boxes below:

Please note that deputations will not be permitted at the meeting where the Council makes its decision.

- [x] Yes – I/We would like to be heard
- [ ] No – I/We do not want to be heard

No anonymous submissions/feedback will be accepted.

fold fold

FREEPOST Authority No.178

Christchurch City Council

Free

Attention: Hearings Team
Akaroa Wastewater Scheme
Christchurch City Council
PO Box 73016
Christchurch Mail Centre
Christchurch 8154

RECEIVED
- 1 MAY 2017
Akaroa Service Centre
Chch City Council

tape here tape here

Submission form

haveyoursay
www.ccc.govt.nz/haveyoursay

PLEASE READ BEFORE COMPLETING YOUR SUBMISSION

The Christchurch City Council is seeking your feedback on the five proposed options for the Akaroa wastewater project:

- **Option 1 – Irrigation of trees or pasture in Robinsons Bay**
- **Option 2 – Irrigation of trees or pasture at Pompeys Pillar**
- **Option 3 – Irrigation of trees or pasture in Takamātua Valley, in combination with another area**
- **Option 4 – Non-potable re-use in Akaroa, in combination with another option**
- **Option 5 – Disposal via a new outfall pipeline to the mid-harbour**

Submissions are public information

Please note: Your full name, address and telephone number are required because this information is important for transparency, and for Christchurch City Council's decision-making process. It also means we can update you on progress. Ideally we would like your email address too, if you have one, as this makes it easier for us to stay in touch with you throughout the engagement process.

Your submission, including your name and contact details, will be made available to the decision-making body, for example the Community Board, Committee and/or Council, to help them make an informed decision.

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How to give us your feedback

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- **Online:** You may enter your submission using the online form provided on the Council's website at **ccc.govt.nz/haveyoursay**
- **By email:** akaroawwproject@ccc.govt.nz
  Please make sure your full name and address is included with your submission.
- **By mail (no stamp required):**
  Freepost 178
  Attention: Hearings Team
  Akaroa Wastewater Scheme
  Christchurch City Council
  PO Box 73016
  Christchurch Mail Centre
  Christchurch 8154
- **By hand delivery to:** Civic Offices, 53 Hereford Street, Christchurch or at the drop-in sessions

Consultation closes on Sunday 30 April 2017

Fundamentally, what environment would you prefer Akaroa wastewater is discharged into?

- ☐ Irrigation of reclaimed water to trees or pasture
- ☐ Disposal via a new outfall pipeline to the mid-harbour
- ☑ Other (please describe)

Please state your reasons why: Re-use/recycled, after treatment by reverse osmosis, into Akaroa.

Please rate the options listed below with a number according to your preference, with 1 being your most preferred option and 5 your least preferred option (please note the options below are in no particular order).

- [5] Option 1 – Irrigation of trees or pasture in Robinsons Bay
- [ ] Option 2 – Irrigation of trees or pasture at Pompeys Pillar
- [5] Option 3 – Irrigation of trees or pasture in Takamātua Valley, in combination with another area
- [1] Option 4 – Non-potable reuse in Akaroa, in combination with another option
- [ ] Option 5 – Disposal via a new outfall pipeline to the mid-harbour
- [ ] Other (please describe)

Please state your reasons for this ranking: The Council should take this "Golden" opportunity to set up a Treatment Plant of the highest standard available, so that treatment is sustainable for the communities long into the future.

Continued overleaf

Would you be more supportive of spray irrigation of treated wastewater to pasture or drip irrigation to trees? Please state your reasons why:

Neither - because of the environmental and amenity impacts on both the valleys and the residents where this is proposed. Irrigation would be piecemeal, difficult to undertake and expensive and inefficient long-term. Many impacts have been highlighted and are unacceptable.

Do you have a preference for the location of reclaimed water storage pond(s)? Please state your reasons why:

Pond 10 would be the only acceptable site as it will have the least visual impact as it can be easily screened and landscaped. It is also close to Akaroa to facilitate ~~use~~ treated water re-use

Do you think the Council should add aspirational projects to the Akaroa wastewater scheme (e.g. fire storage ponds, providing a reticulated wastewater scheme in Takamātua Valley)? If so, which ones do you support and why?

No - to Reticulated waste water in Takamatua Valley.

Do you have any other comments? (Please use additional paper if required):

Waste water is treated and reused/recycled all around the world. Here is an opportunity to set a "Gold" standard and do it properly from day 1 to protect our beautiful environment and communities for future generations.
Perhaps if the water that we are unable to re-use or store, if treated to "drinking standard" may be discharged to a mid-harbour outfall.
Please note: We both support FOBP and Takamatua Valley Ratepayers Assn. Inc. submissions.

Thank you for taking the time to respond. Please include you contact details over the page.

1105

Submission form continued

Contact details

Contact name KEVIN PARTHONNAUD

Organisation name (if representing)

Contact address

Postcode

Phone number (day) Phone number (evening)

Email (if applicable)

Signature Date 24/4/17

fold fold

Do you wish to present your submission at the hearing? Please tick one of the boxes below:

Please note that deputations will not be permitted at the meeting where the Council makes its decision.

☑ Yes – I/We would like to be heard

☐ No – I/We do not want to be heard

No anonymous submissions/feedback will be accepted.

fold fold

FREEPOST Authority No.178

Christchurch City Council

Free

Attention: Hearings Team
Akaroa Wastewater Scheme
Christchurch City Council
PO Box 73016
Christchurch Mail Centre
Christchurch 8154

RECEIVED
- 1 MAY 2017
Akaroa Service Centre
Chch City Council

tape here tape here

Submission form

haveyoursay
www.ccc.govt.nz/haveyoursay

PLEASE READ BEFORE COMPLETING YOUR SUBMISSION

The Christchurch City Council is seeking your feedback on the five proposed options for the Akaroa wastewater project:

- **Option 1 – Irrigation of trees or pasture in Robinsons Bay**
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  Freepost 178
  Attention: Hearings Team
  Akaroa Wastewater Scheme
  Christchurch City Council
  PO Box 73016
  Christchurch Mail Centre
  Christchurch 8154
- **By hand delivery to:** Civic Offices, 53 Hereford Street, Christchurch or at the drop-in sessions

Consultation closes on Sunday 30 April 2017

Fundamentally, what environment would you prefer Akaroa wastewater is discharged into?

- ☐ Irrigation of reclaimed water to trees or pasture
- ☐ Disposal via a new outfall pipeline to the mid-harbour
- ☑ Other (please describe)

Please state your reasons why:

Please rate the options listed below with a number according to your preference, with 1 being your most preferred option and 5 your least preferred option (please note the options below are in no particular order).

- ☐ Option 1 – Irrigation of trees or pasture in Robinsons Bay
- ☐ Option 2 – Irrigation of trees or pasture at Pompeys Pillar
- ☐ Option 3 – Irrigation of trees or pasture in Takamātua Valley, in combination with another area
- ☑ Option 4 – Non-potable reuse in Akaroa, in combination with another option
- ☐ Option 5 – Disposal via a new outfall pipeline to the mid-harbour
- ☐ Other (please describe)

Please state your reasons for this ranking: IN THE WORLD WE'RE LIVING IN THERE'S NO REASONS WE SHOULD BE CONSIDERING ANYTHING ELSE.

Continued overleaf

Would you be more supportive of spray irrigation of treated wastewater to pasture or drip irrigation to trees? Please state your reasons why:

NONE OF THOSE TWO AS THIS PROVE A DUMPING SYSTEM.
BUT IF THE COUNCIL DOES GO DOWN THIS ROAD, THE DRIPPING WOULD BE PREFERED.

Do you have a preference for the location of reclaimed water storage pond(s)? Please state your reasons why:

STORAGE POND TO FROM WHAT IS PROPOSED BUT ANYWHERE CLOSE TO AKAROA (ON ALL SIDE OF AKAROA) WOULD MAKE SENSE IN THE REUSE OPTION. LIMITING COST OF INSTALATION, MAINTENANCE---

Do you think the Council should add aspirational projects to the Akaroa wastewater scheme (e.g. fire storage ponds, providing a reticulated wastewater scheme in Takamātua Valley)? If so, which ones do you support and why?

YES - PLEASE SEE ATTACHMENTS.

Do you have any other comments? (Please use additional paper if required):

YES. PLEASE SEE ATTACHMENTS.

Thank you for taking the time to respond. Please include you contact details over the page.

Aiming toward 100% reuse in Akaroa and be a leading example for NZ and the world.

Why?

Because water is the most precious resource in the world (according to Ecan) and we shouldn't be wasting it, and because our economy with Tourism is a massive draw card of who we are with the 100% Pure NZ branding.

I have 3 reasons for my choice:

- Water is a resource,
- We need to plan ahead and
- A large part of our economy depends on NZ being promoted as a green place

I would like to start by a statement found on the Council website in the introduction to their *Climate Smart Strategy 2010.*

Christchurch (Akaroa being part of Christchurch) *is vulnerable to the physical impacts of climate change, such as sea-level rise,* ***drought****, and floods. Our way of life, natural landscapes and our* ***economy****, based in agriculture and* ***tourism****, are all vulnerable to these changes. (...)*

Being Climate Smart also means we plan ahead to ensure that our community is resilient to future unavoidable changes to our climate.

Are we doing anything toward those lines? Most options presented to us are about getting rid of the water, getting rid of a resource. This is far from planning *ahead to ensure that our community is resilient to future unavoidable changes to our climate.* Is it not?

If we are talking about droughts wouldn't this mean that we ought to be preserving our water and not dumping it?
The Council is talking about being able to reuse 25% of the treated water in public toilets and watering parks to start with, which is great. 25% of water reused means that you do not have to find 25% of water from somewhere else such as Takamatua as it is happening at the moment. And every 4 years you have saved a full year of supply.
Plus hearing about BECA's report, they are confident that we could reuse the all of it. Perfect and inspirational.

According to the above statement flooding is predicted? As a new resident to Robinson's bay I can only talk about the 2 years my wife and young daughter have been living in the bay but I also, with concern, listen to older residents.

In spring and autumn the ground is full of water. With the first cyclone Debbie a slip happened on the main road and a week following cyclone cook (which was a normal rainy day), the ground is still squishy and streams are still higher than usual and still puddles on the ground.

My concern regarding irrigation is that PDP and BECA still do not know the all of the ground structure. All Robinsons bay residents are telling us, and them that the ground is very different from one side of each valley to another. Very few geotechnical analyses have been conducted and some of the few drills that have been done had missing data. Surely this cannot be enough!
And so saying that the rate of irrigation (in comparison to Rotorua) will be lower; 2mm instead of 10mm does not reassure me.

How can you be standing in public and being 100% sure that such a tragedy won't happen in 10 or 20 years when you do not have all the data. If you put water on a dry sponge, it will absorbed a lot of water but if you try to put the same quantity on a wet sponge, it overflows. If within 5 meters you have an impermeable layer, the ground will not be able to absorbed as much and the water will simply slip to the nearest water catchment (springs, streams...) and created instability in the area, flooding and slips. Who would have to deal with this and who would have to compensate?

Lastly working in Tourism, in the Jewel of Christchurch as it is described by many, I know that New Zealand is seen as a green country because we're not using nuclear, because of all the parks, forests, endangered species and work done to save some of them.

Unfortunately when you have water restrictions signs being raised, when you have a "Do not swim, polluted water" sign by the main beach, this is far from showing a green image of us.

But being seen as a green country is a huge draw card for New Zealand's economy. People are coming from all around the world to see our untouched/unspoiled areas, to see and be part of it.
Last year the government made over 2.5 billion on GST alone.

We need to keep this momentum and so I truly believe that this project is the perfect opportunity for this. Show that we are doing something useful with our water, with a resource. Show future tourists that we are planning ahead and are the green place we claim to be.

We are proud of branding ourselves 100% Pure NZ. Let's show the world that that is what we are; let's be true to our branding.

Reuse of the water is happening in other parts of the world and has been for almost a century in some countries. Soon all of New Zealand will face the same situation of finding a better way of treating and dealing with water; let's take 5 minutes and be the example of what can be done.

With this in mind the government must step in and allocate time and money to keep this green image.

Solution exists, why are we so archaic and why aren't we be thinking forward?

Now is the perfect opportunity to do something useful with it and plan ahead.

Based on those 3 statements:

- Water is a resource,
- We need to plan ahead and
- A large part of our economy depends on NZ being promoted as a green place

I choose Option 4: Non potable reuse in Akaroa in combination with another option.

Another option being in place for the necessary time to reach 100% reuse in Akaroa as suggested by the Friends of Banks Peninsula in their submission.

Aspirational project

- Please consider something similar as Organica. Combining a treatment system to a touristic attraction.
- Water feature
- Botanic Garden, flower baskets all around Akaroa to beautify it
- An education centre on sustainability (eg. in a structure similarly aesthetically as Organica plant or the small cottage by the recreation ground)
- Water storage for fire fighting
- Communal vege garden/food forest

CHRISTCHURCH CITY COUNCIL
Akaroa Wastewater Scheme

- Received via Have Your Say -

Submissions close 5pm, 30 April 2017

Full Name*:	Andrew Dark
Contact Address*:	
Postcode:	
Telephone number:	
Email Address:	
Date Sent:	5/2/2017 9:50:45 AM
Would you like to attend the hearings for this consultation?	No
I am completing this submission:	For myself
Role within Organisation	
Group/Organisation Names	
How many people do you represent?	
Preferred environment for Akaroa wastewater discharge:	Irrigation of reclaimed water to trees or pasture
If Other, please describe and state reasons	The outfall option has already been tested at a hearing and declined. Other feasible options are available.
Option 1	Option 4 - Non-potable reuse in Akaroa, in combination with another option
Option 2	Option 1 - Irrigation of trees or pasture in Robinsons Bay
Option 3	Option 3 - Irrigation of trees or pasture in Takamātua Valley, in combination with another area
Option 4	Option 2 - Irrigation of trees or pasture at Pompeys Pillar
Option 5	Option 5 - Disposal via a new outfall pipeline to the mid-harbour
Option 6	Please select
Other	
State reasons for ranking	Although non-potable re-use isn't a standalone option I think it needs to be at the top of the list in order to help address the concerns that people from the other bays have about Akaroa's wastewater being piped into their "back yard". It also sends a good message about water use efficiency, given that the town's water supply is usually on partial restrictions over summer (e.g. garden watering only every second day). The Pompey's Pillar option is not appropriate if there are feasible alternatives that don't require pumping.
Would you be more supportive of spray	I am in favour of irrigating trees. Several reasons for this: it would allow some establishment of new native bush areas; there is more scope for irrigating trees during winter (potentially resulting

irrigation of treated wastewater to pasture? Why	in lower storage pond volume requirements); drip irrigation would help deal with people's concerns about odour or spray drift (although the wastewater would be treated to a very high standard anyway).
Do you have location preference? Why:	No firm preference, so long as the sites are geotechnically sound and impacts on nearby residents are minimised.
Should Council add aspirational projects to the Akaroa wastewater scheme?	Reticulating wastewater in Takamatua and Robinsons valleys may be appropriate if those areas are being used as disposal sites. If the valleys are already going to contain scheme infrastructure the additional cost of providing reticulated wastewater dispo
Any other comments?	

Submission No: 1110

CHRISTCHURCH CITY COUNCIL
Akaroa Wastewater Scheme

- Received via Have Your Say -

Submissions close 5pm, 30 April 2017

Full Name*:	Lennox Willett
Contact Address*:	
Postcode:	
Telephone number:	
Email Address:	
Date Sent:	5/2/2017 10:04:18 AM
Would you like to attend the hearings for this consultation?	No
I am completing this submission:	For myself
Role within Organisation	
Group/Organisation Names	
How many people do you represent?	
Preferred environment for Akaroa wastewater discharge:	Irrigation of reclaimed water to trees or pasture
If Other, please describe and state reasons	The outfall pipeline option has already failed to gain resource consent. Other options are available that are technically feasible and more likely to be consentable.
Option 1	Option 4 - Non-potable reuse in Akaroa, in combination with another option
Option 2	Option 1 - Irrigation of trees or pasture in Robinsons Bay
Option 3	Option 3 - Irrigation of trees or pasture in Takamātua Valley, in combination with another area
Option 4	Option 2 - Irrigation of trees or pasture at Pompeys Pillar
Option 5	Option 5 - Disposal via a new outfall pipeline to the mid-harbour
Option 6	Please select
Other	
State reasons for ranking	Re-use of treated wastewater within Akaroa should be at the top of the list to help address the concerns that people from the other bays have about Akaroa's wastewater being piped into their local areas. It would also send a good message about water use efficiency within Akaroa, given that the town water supply is usually on partial restrictions over summer. The Pompeys Pillar option should not be considered unless the gravity-fed options are shown to not be feasible.

Would you be more supportive of spray irrigation of treated wastewater to pasture? Why	I would be more supportive of drip irrigation to trees. This would allow new areas of native bush to be established; there is more scope to irrigate trees during winter; using drip irrigation could help to address any concerns about potential odour or drift that could result from spray irrigation.
Do you have location preference? Why:	I don't have a strong preference so long as the site(s) are shown to be geotechnically suitable, and any effects on nearby residents are adequately addressed.
Should Council add aspirational projects to the Akaroa wastewater scheme?	If Robinsons and /or Takamatua Valleys are being used as land-application sites, it would be appropriate to add in reticulated wastewater schemes for these areas. If the valleys are going to contain infrastructure for the disposal scheme anyway, it may not be too expensive to add in a reticulation system.
Any other comments?	

1112

Submission form continued

Contact details

Contact name Catrina Brocherie + Gary Irvine

Organisation name (if representing) Cairn French Ancestry -

Contact address

Postcode

Phone number (day)

Phone number (evening)

Email (if applicable)

Signature

Date 25.4.17

Do you wish to present your submission at the hearing? Please tick one of the boxes below:

Please note that deputations will not be permitted at the meeting where the Council makes its decision.

- [x] Yes – I/We would like to be heard
- [ ] No – I/We do not want to be heard

No anonymous submissions/feedback will be accepted.

FREEPOST Authority No.178

Christchurch City Council

Free

Attention: Hearings Team
Akaroa Wastewater Scheme
Christchurch City Council
PO Box 73016
Christchurch Mail Centre
Christchurch 8154

P.T.O.

RECEIVED
28 APR 2017

Submission form

haveyoursay
www.ccc.govt.nz/haveyoursay

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- **Option 3 – Irrigation of trees or pasture in Takamātua Valley, in combination with another area**
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  Attention: Hearings Team
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  PO Box 73016
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Consultation closes on Sunday 30 April 2017

Fundamentally, what environment would you prefer Akaroa wastewater is discharged into?

- [ ] Irrigation of reclaimed water to trees or pasture
- [ ] Disposal via a new outfall pipeline to the mid-harbour
- [x] Other (please describe)

Please state your reasons why:

Purified water via existing site

Please rate the options listed below with a number according to your preference, with 1 being your most preferred option and 5 your least preferred option (please note the options below are in no particular order).

- [ ] Option 1 – Irrigation of trees or pasture in Robinsons Bay
- [ ] Option 2 – Irrigation of trees or pasture at Pompeys Pillar
- [ ] Option 3 – Irrigation of trees or pasture in Takamātua Valley, in combination with another area
- [ ] Option 4 – Non-potable reuse in Akaroa, in combination with another option
- [ ] Option 5 – Disposal via a new outfall pipeline to the mid-harbour
- [x] Other (please describe)

Please state your reasons for this ranking:

Existing site on Reserve Rd - Queens chain - public land set aside for public use. OPTION (4) cannot economically sustain this system or afford the type of plant required to remove all pollutants suggested for home garden ie viruses, pharmaceuticals hormones metals use

Would you be more supportive of spray irrigation of treated wastewater to pasture or drip irrigation to trees? Please state your reasons why:

NOT sustainable or economical as documented by FOB
our topography is clay pan soils bedrock and swamplands

Do you have a preference for the location of reclaimed water storage pond(s)? Please state your reasons why:

We do not want water storage ponds at the entrance to Akaroa
we do not want midges, bird pollution and odour
destroying our pristine environment.

Do you think the Council should add aspirational projects to the Akaroa wastewater scheme (e.g. fire storage ponds, providing a reticulated wastewater scheme in Takamātua Valley)? If so, which ones do you support and why?

Watertanks to all residents to an agreed capacity to trap rainwate
for re-usage. Additional capacity to be responsibility of home owne
Council subsidies for water efficient home appliances, shower
roses etc. Introduce a user pay system.

Do you have any other comments? (Please use additional paper if required):

Akaroa has had a declining population over the last 10 years
A green belt prevents further development. There will never be
sufficient people to tap into a purple pipe system, to reuse
100% waste water reticulation.
We have little confidence in the upkeep of this system.
We live with unswept roads left with excessive shingle deposits,
dirty polluted beaches with geese fouling the shoreline, unemptied
rubbish bins, broken kerbsides etc
Substandard Contractors have left us with patchy poorly sealed
roads, residual shingle, broken kerbside pavers, flooded homes.
These issues have not been resolved or addressed.

Thank you for taking the time to respond. Please include you contact details over the page.

How will you address a wet summer?
Leave us with:
- Water effluent spilling to nearby streams and waterways
- Midges bird pollution
- odour and smell permeating the town.

Akaroa is:
- The gateway to Canterbury Tourism
- Provides employment to the entire Peninsula
- Supports 80 cruise ships a year
- Provides revenue for each City Council
- Provides respite for day trippers wanting to escape pressures of city
- Weekend getaways to soothe frazzled nerves
- Provides crisp clean air, calming waters, birdlife scenic walks
- Town pay homage to our early French Ancestry- who hardships dedication and committment make this town what it is today.
- Employs young vibrant Europeans who can identify with what their own towns once were.
- Our overseas travellers remark, this is one of the most beautiful towns in the world. They cannot believe we have no highrise on the waterfront, no homes on our promontories, no dedicated marina.
- We must keep in mind that none of the above happened by accident. The town has been carefully planned and maintained to achieve this level of simple sophistication.
- Its what we love about Akaroa- its simple charm and lack of complication.
- Do we want to risk 'killing the Goose that lays the Golden egg'?

keep it simple - Watertanks and purified water discharge to the sea.

Submission No: 1116

CHRISTCHURCH CITY COUNCIL
Akaroa Wastewater Scheme

- Received via Have Your Say -

Submissions close 5pm, 30 April 2017

Full Name*:	Pamela Fisher
Contact Address*:	
Postcode:	
Telephone number:	
Email Address:	
Date Sent:	5/2/2017 12:53:33 PM
Would you like to attend the hearings for this consultation?	Yes
I am completing this submission:	For myself
Role within Organisation	
Group/Organisation Names	
How many people do you represent?	
Preferred environment for Akaroa wastewater discharge:	Other
If Other, please describe and state reasons	Non-potable re-use in Akaroa, in combination with another option This option provides a solution to an existing problem re availability of water in Akaroa during particular times of year and would demonstrate a responsible environmental approach by council for the community. Further information included in attached document.
Option 1	Option 4 - Non-potable reuse in Akaroa, in combination with another option
Option 2	Please select
Option 3	Please select
Option 4	Please select
Option 5	Please select
Option 6	Please select
Other	
State reasons for ranking	
Would you be more supportive of spray irrigation of treated wastewater to pasture? Why	

Do you have location preference? Why:	
Should Council add aspirational projects to the Akaroa wastewater scheme?	
Any other comments?	

I fully endorse the submission lodged by the Friends of Banks Peninsular recommending the adoption of the non-potable water re-use in Akaroa as the preferred option. The research supporting the fact that Akaroa's demand for more water could be addressed by having a high standard of treatment for wastewater which could be used when and where needed would provide a valuable resource for the community. Akaroa's water shortage issues are predicted to get worse. To me it makes more sense to have the water treated to a level where it can be used to address a problem rather than adopting a solution which is purely for disposal on land which doesn't necessarily need it or want it.

I am reliant on the Friends of Banks Peninsula's submission to provide all the scientific and technical evidence. My submission is purely about my own concerns, feelings and thoughts on this issue and how it pertains to me and my connection with Robinsons Bay.

I would like to lodge my submission against the proposed Akaroa Wastewater scheme using Robinsons Bay and Takamatua as areas for wastewater disposal generated from Akaroa.

BACKGROUND:

My family has land in Robinsons Bay running from Robinsons Bay Road and connecting with Sawmill Road: Lot 10A and Lot 11A Deposited Plan 141 and Lot 14C Deposited Plan 1410. This land has been in my family for several generations being transferred to my late mother and aunt from their uncle John Duxbury in 1951. This land was subsequently farmed by my grandfather Alex Duxbury and became solely my mother's after her sister's death. It was my grandfather's wish that his daughters never sell this block of land. Robinsons Bay has particular significance in my family with my mother growing up there and my grandfather farming there until his death. This land is currently used by my brother to support his farming business.

This block of land will be inherited by myself in time as it is currently in an estate. Any plans I had about building or residing on this block have been significantly impacted by the proposed plan which identifies it for both a wastewater pond and for irrigation. I am unsure about what options I would have if this eventuated and how it might impact on our choices or options of how this land could be utilized and what consents it would be require.

This has been particularly distressing to have a part of my inheritance be tagged for this purpose. I can fully understand the feeling of the residents of Robinsons Bay and Takamatua who are also facing this plight. These people have chosen to live in these areas of Banks Peninsula based on the values and lifestyle these places and communities offer. This is potentially under thread with the proposed disposal scheme and feel that their bays are being used as dumping ground for waste which they haven't generated. The threatened loss of value that properties in these bays will experience and the stigma associated with this scheme will be immense and irrepairable.

CONCERNS:

My knowledge of this area doesn't identify any needs for irrigation and with a fresh water stream flowing through the property I have real concerns about the environmental impact.

Recent evidence of studies of waterways recognised the impact of increased nitrogen levels in waterways and the impact this has on the natural environment. Currently this land is used for cattle grazing.

It was also a surprise to learn in the recent council document that another block of land which belongs to my mother's estate on Okains Bay Valley Road has been identified as a potential site for another wastewater pond. This has never been communicated directly to us which I find particularly disappointing and inconsiderate when it would have a significant impact on our ability to choose how this land is used and what options there would be for us if the wastewater disposal option went ahead.

On a more holistic level, I find the intention to use Robinsons Bay and Takamatua as areas for disposal of wastewater that is not required or needed extremely disappointing in the effect this would have on the integrity, character and nature of these bays. This would be irrevocably destroyed and the impact on the social wellbeing of these communities would be at very high risk. Through attending several meetings where this proposal was discussed, I have witnessed and experienced this first hand. The strong community connection is evident and these residents are passionate about maintaining their current environment; not putting it at risk or having it their land or people threatened in any way.

From what I understand, there has been no clear lines of communication around potential withholding periods for stock which may be grazing the land where the wastewater is intended to be disposed. This in itself identifies a risk of disease or uncertainty around the quality and status of the water and the potential to jeopardise the health and safety of this practice on livestock and consumers. It has also been recorded that there can be no absolute guarantee on viruses with the treatment options considered for this water. If this is the case, what limitations would this place on the use of the land?

I don’t feel that enough research has been done to instil confidence in the residents of Robinsons Bay or Takamatua to reassure everyone of the potential worst case scenarios and what contingencies would be actioned in the event of unpredictable events. These could include natural situations, eg. Cyclones producing unseasonal and extreme rainfall as we have experienced recently, breakdowns in the treatment process, any failures with the ponds and the consequences of frequent disposal of wastewater on land and potential build ups of elements that could be detrimental to the natural environment.

RECOMMENDATION:

I fully support the proposal from the Friends of Banks Peninsula endorsing Option 4 - Non-potable re-use in Akaroa, in combination with another option. This would address a need for water as a valuable resource in a community that is often deprived of this during particular months. I believe it is a much better option to find a use for this water treated at the highest possible level which helps to provide a solution rather than dispose of it as a waste product.

A solution that maximises benefits and minimises risks definitely makes sense to me as I am sure it does to many others. It addresses a problem and would definitely set a benchmark for other communities and councils to follow if done well.

Submission No: 1135

CHRISTCHURCH CITY COUNCIL
Akaroa Wastewater Scheme

- Received via Have Your Say -

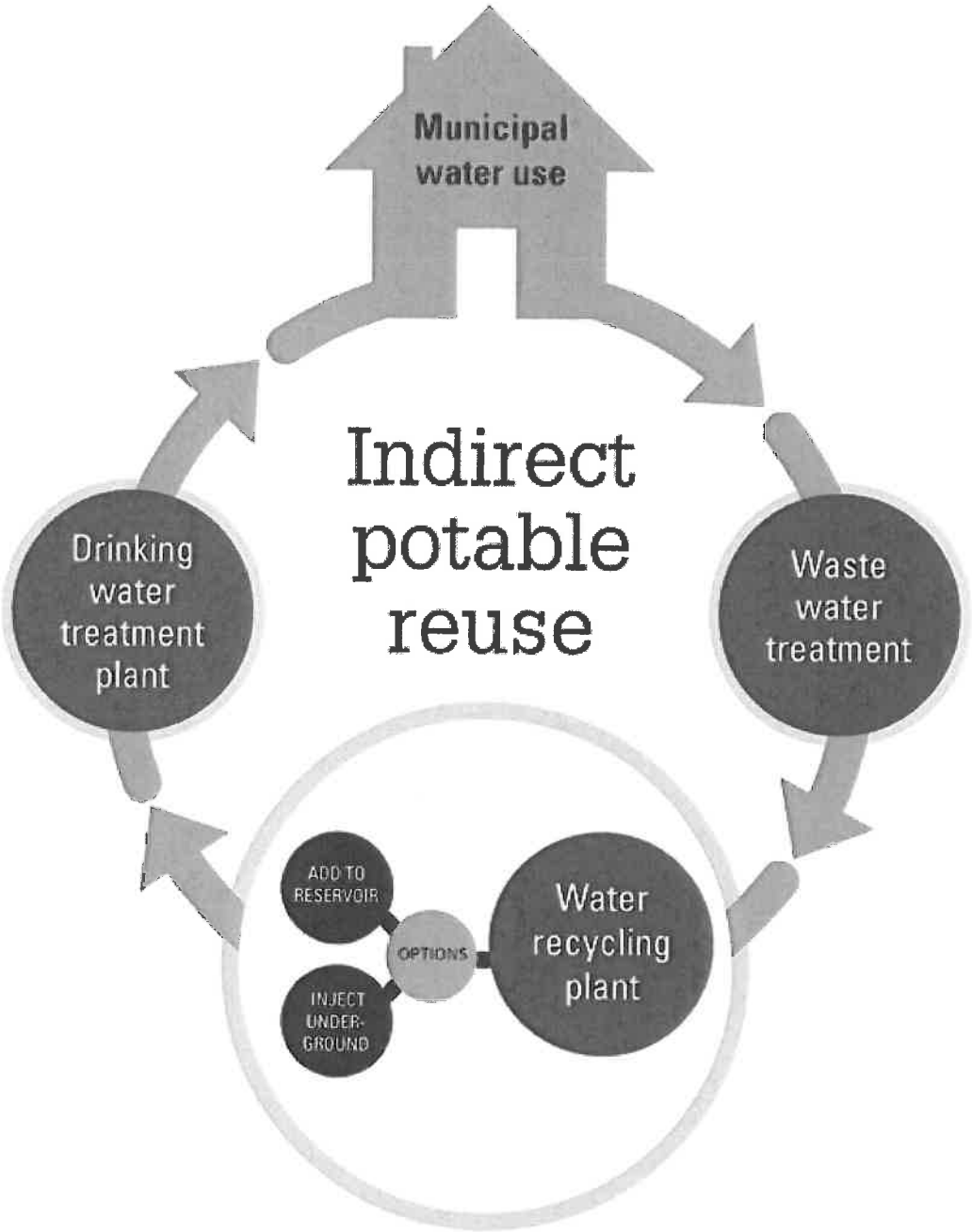
Submissions close 5pm, 30 April 2017

Full Name*:	Linton Johnston
Contact Address*:	
Postcode:	
Telephone number:	
Email Address:	
Date Sent:	5/2/2017 1:05:32 PM
Would you like to attend the hearings for this consultation?	No
I am completing this submission:	For myself
Role within Organisation	
Group/Organisation Names	
How many people do you represent?	
Preferred environment for Akaroa wastewater discharge:	Other
If Other, please describe and state reasons	I attach herewith my submission
Option 1	Please select
Option 2	Please select
Option 3	Please select
Option 4	Please select
Option 5	Please select
Option 6	Please select
Other	
State reasons for ranking	
Would you be more supportive of spray irrigation of treated wastewater to pasture? Why	

Do you have location preference? Why:	
Should Council add aspirational projects to the Akaroa wastewater scheme?	
Any other comments?	

AKAROA SEWAGE AND WASTEWATER BENEFICIAL RECYCLING PROJECT SUBMISSION TO CHRISTCHURCH CITY COUNCIL

APRIL 25 2017



THE PERFECT CIRCLE FROM MOTHER EARTH AND BACK TO MOTHER EARTH

AKAROA HARBOUR HAS A CLEAN GREEN PURE AND SUSTAINABLE NATURAL WATER SUPPLY

REPLACE WHAT WE TAKE FROM MOTHER EARTH

NO EFFLUENTS SENT TO OUR FOOD SOURCES

NO EFFLUENTS SENT TO OUR LAND SURFACES

AKAROA SEWAGE AND WASTEWATER BENEFICIAL RECYCLING PROJECT SUBMISSION TO CCC

APRIL 2017

Our Akaroa Harbour community needs are simple:

1. **We need more drinking water. (Akaroa currently has seasonal water restrictions)**
2. **We need to convince the World Public (not just Akaroa) that our water is "Natural" and "Pure". Those two words are "very" important and have distinct meanings.**
3. **We need to make our Sewage "disappear" in the most "Cost Effective" and environmentally friendly manner possible.**
4. **We need to cease dumping any waste products directly or indirectly into our water ways or onto our land surfaces to convince Kiwis and the world that we truly are "Clean and Green" and find a natural recycling process that we can be proud of.**

The solution for Akaroa is simple:

1. **Collect sewage and waste waters. (Via existing sewer pipes)**
2. **Primary filtration via a new collection and pumping station to be built at the North end of Akaroa.**
3. **Pump the primary filtered water to a secondary processing plant to produce water of high quality to new facilities to be built on Old Coach Road.**
4. **Pump the processed water to "Recharge the Natural Aquifer of water held by the Basaltic Rock formation" that feeds our "Natural Streams and Springs". This technology is named "MAR" Managed Aquifer Recharging. Sometimes named as Managed Artificial Recharging. MAR is already being practised in NZ and we have many good reference sites including Canterbury.**
5. **Collect and pump the "Natural Water" from the traditional Springs and Streams to the existing water treatment reservoir on L'Aube Hill ready for final sterilization and polishing by the existing plant to produce "Pure and Natural Potable Water."**
6. **Reticulate the "Pure and Natural" resource water through the existing domestic water system without restrictions.**

BACKGROUND

The Technology to convert sewage to potable water has been around since the sixties. The technology has increased dramatically since then and there are many examples of successfully operating systems around the Globe that perform more efficiently with much less capital and running costs than the original systems.

We are now asking "If the answer is so simple and cost effective then why are Kiwis so insistent on ignoring the technology?" WHY? WHY? WHY? The answer is incredibly simple!! We don't like the "thought" of recycling sewage. We don't like knowing the source of the water that has been so recycled regardless of the fact that there are millions of people around the Globe in places like London, New York, San Diego, Orange County and Namibia et al that have been drinking recycled sewage for decades without any issues.

The "Good News" for Akaroa residents is that we now have the technology that can make the "bad thoughts" disappear and achieve all of our "Needs". The answer is "Managed Aquifer Recharging of Mother Earth"! MARME!! Perfect!!

BENEFITS

1. **If we process all our waste water products back into our Aquifers after they have been "processed", we constantly "stock up" the existing water volume that is naturally stored there. Instead of just taking the water out and eventually wasting and "dumping" it we can return the water to where it came from in a complete "Cycle" preventing natural springs from drying up. As a bonus we could even see more springs pop up? There will be no more water restrictions and we can future proof population growth in the area.**

2. **If we drink water that is coming from our natural aquifers in a natural and pure form it does not create any bad thoughts. Instead we will be proud of how we manage our water resources and we will be happy to tell the World about it.**

3. **We do not need to build an expensive secondary water reticulation system called "Pink Pipes" that return "impure water" to our land surfaces for irrigation or effluent disposal.**

4. **We do not have to "compulsory buy" massive areas of private land to irrigate with "impure water" close to existing residents homes.**

5. **We do not have to endure massive property "devaluations" due to original CCC proposals.**

6. **We do not have to discharge "anything" impure into our long harbour or the offshore seawaters ever again!!**

7. **Akaroa Harbour residents will at last be able to keep an "honest face" when they tell the world that we are "clean and green". The CCC health department water test results will prove that we are in fact "Clean Green Natural and Pure"!!**

8. **The tourism benefits are endless. Akaroa can lead NZ into a new era just like it did being the first Town in NZ to produce "Free Electricity" from hydro power!!!!**

9. **The health benefits are huge. We can finally take Shellfish and Seafoods with total confidence from our harbour, and our kids can swim in the sea 365 days of the year. Our sea life Dolphins, Seals, Penguins and Birds et al will have more chance of growing with us into the future.**

10. **Our Maori Iwi will breathe a huge sigh of relief when they realise that Pakeha are finally listening to what they have been saying about fouling local food sources with excrement effluent for one hundred and seventy seven years and disrespecting their Tapu (Takapuneke) site close to and including Onuku.**

PROPOSED CCC ACTION PLAN

- **I totally reject any of the Waste Water proposals submitted by CCC todate.**
- **I "partially" endorse the submission of Friends of Banks Peninsula in that they have recognised the need to re-use any waste products. However I believe that we should be adopting proven technologies that will provide us with a more elegant and culturally acceptable solution as described above.**
- **CCC Councillors, Engineers and their Consultants must adopt a positive "Mind Set" that follows the basic principles of recycling. We cannot continue to take and not give back. The days of dumping effluents are over! Our old habits and stupid beliefs are actually killing us and our planet. It is time for change! Now!!!!**
- **CCC must rethink and delay any confirmation of the current proposals that are on the table until this submission research has been totally exhausted and the feasibility being confirmed.**
- **Akaroa needs Hydrologist and Geologist Specialists Engineers to assess the feasibility of this submission. We have those people here in Canterbury. They are specialists and are already "Recharging" the Canterbury Plains in much the same manner this submission outlines. We need to get those people into Akaroa with a positive mind set that will find the best answers and best places for recharging. It may be that we have to build "Artificial Recharging Sites" in the form of artificial wetlands or drilled holes that will connect with the Volcanic sub strata. Be aware that an "Aquifer" is any sub surface material that will absorb and store water like a sponge. Our natural Akaroa Volcanic Aquifers have been recharging themselves for thousands of years. Basalt is an incredibly hard rock but because of the way it is formed from molten rock being hit by cold air and cold water on eruption it is "fractured" and "layered" like a sponge. That sponge has been providing the water for Akaroa ever since Akaroa Harbour volcanically burst into life. We only need to find the best place/s to "recharge" and replace the water that what we are taking.**
- **We need to find the best supplier/s of the technology required. There are many proficient companies in places like USA, Germany and Australia. The Australians may yet be leading the world with the technology as they really need to adopt the concept of recharging fast! Global warming will accelerate those needs in many countries. The water technology is growing at an exponential rate. The Australian Government has given one leading edge company the green light and bag full of money to go the next step up and produce results by 2019 which are based on "Graphene Filtration". Graphene filtration has recently been proven to "desalinate seawater". Regardless of which system is adopted for Akaroa in 2017, it must be capable of being easily upgradeable to all new future technologies as they come on stream. If Akaroa recycles all of its waste water and still runs dry in the future, we could yet be pumping sea water (through Graphene) to supplement the natural cycle.**
- **I would like the opportunity to be heard at any hearings.**

Acknowledgements:--
To: Ngai Tahu and Onuku Iwi for giving me crystal clear inspiration and motivation. They opened my eyes to realise that "Never before have so many people been so deaf and so stupidly dumb". Thank you for the wake up call!! Please accept my personal apologies for what Pakeha have done to our Akaroa Harbour. I'm so sorry!! I truly hope the CCC can realise that they also need to formally apologise for what happened in Takapuneke in 1960 when the existing sewage treatment system was built.

To: Friends of Banks Peninsula especially Suky Thompson. Your efforts todate have been utterly remarkable. They gave me the traction, inspiration and energy to continue. Thank you!!

SUPPORT LINKS

http://www.golder.com/en/modules.php?name=News&sp_id=1199&page_id=208
Golder & Associates are local specialists in environmental water engineering.
https://www.theguardian.com/sustainable-business/2015/jan/20/turning-human-waste-into-drinking-water
Bill Gates funds new technology to convert sewage into drinking water for 110,000 person community with no lost energy. Cost US$ 1.5m.
http://blogs.ei.columbia.edu/2011/04/04/from-wastewater-to-drinking-water/
2011 San Diego system: Sewage to drinking water 1,000,000 gallons/day (3,875,000 litres). Current population 1.4m people. US$ 11.90m
http://mena-water.com/home/water-solutions/
German manufacturer of "Loo to Tap" water recycling systems in a shipping container!!
http://www.janickibioenergy.com/news/press/
Janicki Bioenergy Ltd producers of Omniprocessor sewage to drinking water black boxes. 2017 News reports on other applications of interest to NZ mainly farming/dairy.
https://www.ocwd.com/gwrs/
Orange County Water System USA. Recycles water and introduces it back into the aquifers for later pumping to the water reticulation system.
https://water.usgs.gov/ogw/aquiferbasics/volcan.html
Good examples of recharging Volcanic and other "Rock" based aquifers.
https://www.friendsofbp.org.nz/
Akaroa Harbour and Banks Peninsula residents group.
http://www.cleanteq.com/
Leading Australian manufacturer of the latest water recycling technology.

SUBMISSION PRESENTED BY:-

John Baker

Submission No: 1149

CHRISTCHURCH CITY COUNCIL
Akaroa Wastewater Scheme

- Received via Have Your Say -

Submissions close 5pm, 30 April 2017

Full Name*:	Tom Patterson
Contact Address*:	
Postcode:	
Telephone number:	
Email Address:	
Date Sent:	5/2/2017 2:16:39 PM
Would you like to attend the hearings for this consultation?	No
I am completing this submission:	For myself
Role within Organisation	
Group/Organisation Names	
How many people do you represent?	
Preferred environment for Akaroa wastewater discharge:	
If Other, please describe and state reasons	
Option 1	Option 2 - Irrigation of trees or pasture at Pompeys Pillar
Option 2	Option 5 - Disposal via a new outfall pipeline to the mid-harbour
Option 3	Please select
Option 4	Please select
Option 5	Please select
Option 6	Please select
Other	
State reasons for ranking	
Would you be more supportive of spray irrigation of treated wastewater to pasture? Why	

Do you have location preference? Why:	
Should Council add aspirational projects to the Akaroa wastewater scheme?	
Any other comments?	