

Canterbury Water Management Strategy

Waimakariri Zone Committee

Agenda

Monday 13 May 2019

3.00pm

***Council Chambers,
Waimakariri District Council,
215 High Street Rangiora***

Members:

David Ashby (Chair)
Grant Edge (Deputy Chair)
Carolyn Latham
Judith Roper-Lindsay
Gary Walton
Cameron Henderson
Michael Blackwell
Arapata Reuben (Te Ngai Tūāhuriri Rūnanga)
John Cooke (Te Ngai Tūāhuriri Rūnanga)
Sandra Stewart (WDC Councillor)
Claire McKay (ECan Councillor)

Chairperson and Members

CWMS WAIMAKARIRI ZONE COMMITTEE

Agenda for the meeting of the **CANTERBURY WATER MANAGEMENT STRATEGY WAIMAKARIRI ZONE COMMITTEE** to be held in the **WAIMAKARIRI DISTRICT COUNCIL CHAMBERS, 215 HIGH STREET, RANGIORA** on **MONDAY 13 MAY 2019** commencing at **3.00PM.**

Adrienne Smith
Governance Coordinator

**Recommendations in reports are not to be construed as
Council policy until adopted by the Council**

BUSINESS

PAGES

1 BUSINESS

1.1 KARAKIA

1.2 APOLOGIES

1.3 REGISTER OF INTERESTS

5 - 6

Conflicts of interest (if any) to be reported for minuting.

1.4 CONFIRMATION OF MINUTES

Minutes of the Canterbury Water Management Strategy Waimakariri Zone Committee meeting – 8 April 2019

7 - 16

RECOMMENDATION

THAT the CWMS Waimakariri Zone Committee:

- (a) **Confirms** the minutes of the Canterbury Water Management Strategy Waimakariri Zone Committee meeting, held on 8 April 2019, as a true and accurate record.

MATTERS ARISING

2. **OPPORTUNITY FOR THE PUBLIC TO SPEAK**

3. **DENITRIFICATION WALL PILOT STUDY IN SILVERSTREAM -
UPDATE** – Lee Burberry and Murray Close – Environmental Science and
Research (ESR)

17 - 18

RECOMMENDATION

THAT the CWMS Waimakariri Zone Committee:

- (a) That the committee receive this update with consideration to the implementation of the Waimakariri Land & Water Solutions Programme.

4. **WDC WATERWAY CONSENT APPLICATION BRIEFING** – Simon Collin
(WDC Infrastructure Manager, 3 Waters Team)

19

RECOMMENDATION

THAT the CWMS Waimakariri Zone Committee:

- (a) **Receives** this report for review,
- (b) **Provides** feedback on this draft consent application.

5. **COMMITTEE UPDATES – MURRAY GRIFFIN, (CWMS FACILITATOR,
ECAN)**

20 - 21

- 5.1 CWMS Regional Committee Update – 9 April meeting report from Carolyn Latham

22

- 5.2 Media and Communications – April Update – Gina McKenzie
(Director – Real Communications)

23 - 24

- 5.3 Waimakariri Water Zone Committee April eNewsletter

25 - 28

- 5.4 Lineside Drainage and wetland – update – Andrew Arps, (Northern Zone Manager, ECan)

29 - 32

- 5.5 Zone Committee Refresh 2019 – Murray Griffin, (Waimakariri Water Zone Committee Facilitator, ECan)

RECOMMENDATION

THAT the CWMS Waimakariri Zone Committee:

- (a) The Zone Committee are asked to receive these updates for its information and regarding the committee's work programme and community engagement priorities for 2019.

6. GENERAL BUSINESS

KARAKIA

NEXT MEETING

The next meeting of the CWMS Waimakariri Water Zone Committee will be held on Monday 8 July 2019 commencing at 3.00pm.

7 WORKSHOP – WWZC 2019 WORK PROGRAMME

A workshop for the committee to confirm its work programme for 2019/20 and approach to sub-catchment action plans.

WAIMAKARIRI WATER ZONE COMMITTEE

Register of Interests – at 1 May 2019

Name	Committee Member Interests
David Ashby	<ul style="list-style-type: none"> - Director/shareholder – Pineleigh Farm Limited - Director/shareholder – Dave Ashby Rural Consultants Limited - Shareholder – Waimakariri Irrigation Limited - Member – Cust Main Drain Water User Group
Michael Blackwell	<ul style="list-style-type: none"> - Director/ Shareholder – Blackwells Limited, Kaiapoi - Treasurer – North Canterbury Clay Target Association - 4Ha property, Tuahiwi.
John Cooke	<ul style="list-style-type: none"> - Director/Shareholder – Executive Limousines 2015 Limited - Director/Shareholder – Express Hire Limited - Director/Shareholder – Secure Property Management Limited - Director/Shareholder – Testpro Limited - Director/Shareholder – Acropolis Wedding and Event Hire Limited - Director/Shareholder – Pines Beach Store Limited - Director/Shareholder – Coastal Dream 2005 Limited – 4Ha property, Kaiapoi - Interim Trustee – Section 6 Survey Office Plan 465273 Ahu Whenua Trust
Grant Edge	<ul style="list-style-type: none"> - Director – Edge Landscape Projects Ltd, Edge Plants Ltd, and Edge Products Ltd - Member – NZ Institute of Landscape Architects - Member – Urban Design Forum - Member – QEII National Trust - Member – NZ Forest & Bird - Member – Heritage NZ - 1ha property Fernside (shallow bore user)
Cameron Henderson	<ul style="list-style-type: none"> - Dairy Farmer - Groundwater irrigator - Member – NZ Institute of Primary Industry Management - Member – NZ Dairy Environment Leaders Forum - Chairman – DairyCan - Canterbury Dairy Environment Leaders Forum - Chairman – North Canterbury Federated Farmers
Carolyn Latham	<ul style="list-style-type: none"> - Farmer – Sheep, beef - Director – Latham Ag Ltd Consulting - Shareholder – Silver Fern Farms, Farmlands - Registered Member – New Zealand Institute of Primary Industry Management

Claire McKay	<ul style="list-style-type: none"> - Dairy Farmer - Irrigator and shareholder – Waimakariri Irrigation Ltd - Holder of Groundwater take and use consents in Cust groundwater allocation zone - Holder of Effluent discharge consents - Member – Federated Farmers - Member – DairyNZ Dairy Environmental Leaders forum
Arapata Reuben	<ul style="list-style-type: none"> - Chair – Ngāi Tūāhuriri Rūnanga - Trustee – Tuahiwi Marae - Trustee – Tuhono Trust - Trustee – Mana Waitaha Charitable Trust - Member – National Kiwi Recovery Group - Rūnanga Rep and Chair – Christchurch/West Melton Water Zone Committee - Rūnanga Rep – Ashburton Water Zone Committee
Judith Roper-Lindsay	<ul style="list-style-type: none"> - Director/ecologist – JR-L Consulting Ltd. - Land-owner/small-scale sheep farmer, Ashley downs - Fellow – Environment Institute of Australia and New Zealand (EIANZ)
Sandra Stewart	<ul style="list-style-type: none"> - Self-employed journalist - Land-owner, 4Ha Springbank – sheep & dogs
Gary Walton	<ul style="list-style-type: none"> - Director – Walton Farm Consulting Ltd - Chairman & Shareholder, Loburn Irrigation Co - Trustee – Rugby World Heritage Trust - Life Member – Ashley Rugby Football Club (Inc.) - Farmer – sheep & cattle, Loburn - Registered member – NZIPTM New Zealand Institute of Primary Industry Management

MINUTES FOR THE MEETING OF THE CANTERBURY WATER MANAGEMENT STRATEGY WAIMAKARIRI ZONE COMMITTEE HELD IN THE WAIMAKARIRI DISTRICT COUNCIL CHAMBERS, 215 HIGH STREET, RANGIORA ON MONDAY 8 APRIL 2018 AT 3.00PM.

PRESENT

Dave Ashby (Chairperson), Grant Edge (Deputy Chairperson), Carolyn Latham, Gary Walton, Michael Blackwell, Judith Roper-Lindsay, and Arapata Reuben (Rūnanga representative) (from 3.12pm), John Cooke (newly appointed Rūnanga representative to the committee)

IN ATTENDANCE

Stefanie Rixecker (Director Science, ECan), Robert Johnson (Farmer), Sophie Allen (Water Environment Advisor WDC), John Benn (Department of Conservation), Gina McKenzie (Real Communications), Brent Walton (Waimakariri Irrigation Ltd), Adrian Meredith (Principal Surface Water Scientist, ECan), Kalley Simpson (3 Waters Manager, WDC), Sandy Yong (Department of Conservation, Rangiora), James Ensor (Oxford-Ohoka Community Board and resident), Michael Bate, (Kaiapoi resident), Bruce Stokes (Farmer), Andrew Arps (Zone Team Manager, ECan), Murray Griffin (CWMS Facilitator, ECan) and Adrienne Smith (Governance Coordinator, WDC). Greg Byrnes (Manager, Te Kōhaka O Tūhaitara Trust.)

1 BUSINESS

1.1 KARAKIA

1.2 APOLOGIES

Moved G Walton seconded G Edge

THAT apologies for absence be received and sustained from C Henderson and WDC Councillor S Stewart.

CARRIED

1.3 REGISTER OF INTERESTS

J Cooke to confirm items to be included in the Register of Interest.

1.4 CONFIRMATION OF MINUTES

Minutes of the Canterbury Water Management Strategy Waimakariri Zone Committee meeting – 11 March 2019

Moved G Edge seconded M Blackwell

THAT the CWMS Waimakariri Zone Committee:

- (a) **Confirms** the minutes of the Canterbury Water Management Strategy Waimakariri Zone Committee meeting, held on 11 March 2019, as a true and accurate record, with the following amendments:

Item 2, page 3, second to last paragraph, change “resting” to “testing” and “insecticides” to “herbicides”

Item 3.2, page 4, first paragraph to read "as read"

Item 3.3, page 5, last paragraph change "Plan Change 8" to "Plan Change 7"

CARRIED

MATTERS ARISING

G Edge asked C Latham if the matters raised in Item 3.2 had been raised with the Regional Committee, relating to any proposals that Environment Canterbury had for diversifying the economy. C Latham advised that the last gathering of the Regional Committee was a workshop, not a Regional Committee meeting. The discussion at this workshop centred on the relevance of the Regional Committee and how it can add value to the CWMS and she did not see this as the appropriate place for discussion on the points that were raised at the last meeting. C Latham confirmed there is a committee meeting being held tomorrow (9 April), which she will report back on.

Councillor Claire McKay commented that ECan is not looking at instigating any stock controls, noting the rules and regulations of ECan are outcome focused, as opposed to being input focused. Regarding the point made that there is no representative of the Department of Conservation around the table at the Regional Committee meetings, Cr McKay noted John Benn is a regular attendee at these meetings and he is invited to attend any events that are relevant and noted Environment Canterbury has a strong relationship with the Department of Conservation.

John Benn provided clarification on his reporting lines within his organisation and that he reports back to his Christchurch office.

Regarding comment from Jason Holland on following up on Cam River and its tributaries and the various responsibilities of ECan and Waimakariri District Council. With Jason not present, this will be referred back to the May meeting of the Zone Committee.

2. OPPORTUNITY FOR THE PUBLIC TO SPEAK

Robert Johnston

Mr. Johnston spoke about his concerns with comments recorded from the last meeting of the committee on what ECan is doing in relation to the reduction of stock numbers in favour of a diversified economy across the region. It is not ECans job to consciously and actively seek to reduce stock numbers in the Canterbury region. It is their job to look after matters relating to the environment. Mr. Johnston noted Plan Change 5 of the Land and Water Regional Plan, which involved considerable community consultation, and introduced nutrient limits, which will in itself reduce the cattle numbers.

Following the November 2018 deputation to ECan Councillors, regarding the Ashley River, and the issue of flooding and erosion, he advised he has had the most positive response in the past 25 years. As a result of this, there is a river rating review being undertaken currently, seeking to expand the area of this rating area from the Okuku River to the Ashley Gorge Bridge. In terms of water quality and biodiversity in the riverbeds, Mr Johnson believes this will be beneficial.

In reply, G Edge provided his view, that with the ZIPA it is inevitable that in order to deliver on the required nitrate levels and the fresh water quality, there will be reductions needed in stock numbers. G Edge believes it is the responsibility of ECan, if it is a forward thinking organization, to provide some

guidance for the future. A big part of the ZIPA and justification of science is based on economics, there is a greater opportunity to diversify.

Mr Johnston again noted his concerns with Overseer and the accuracy of reporting through this system. It is useful as a farm management tool, but from a regulatory tool this is not appropriate to be used by ECan, until it can provide a far better degree of accuracy.

Michael Bate

Mr Bate spoke on the Cam River, which he had looked at today by Revels Road noting that the weed is struggling to grow from last winter and asked if there was a chance of having the sediment tested, for toxic residues that may be stopping the weed growth.

Mr Bate asked if there was any results available on the Lineside Road testing. D Ashby noted that this is included in items at this meeting.

Mr. Bate asked if there was any progress on the effects of algal blooms affecting the biodiversity in the Ashley River. J Roper-Lindsay referred to the agenda item advising that information is being arranged by the ECan science team for the Zone Committee. It was agreed that this information be provided at the next meeting of the committee.

Brent Walton – WIL

B Walton advised that there have been six meetings with shareholders asking for feedback on the Regen project. There was a good cross section of views received, some shareholders are conversant with the data and are regular users of this, but there is others who are not so familiar with this. There is a vast improvement in the shareholders understanding and behavior on using irrigation. Regarding finishing the roll out, there are six farms that have no form of scheduling at present and these will be worked on.

An upgraded water metering policy is about to be released, and all farms will have to have this. It is the shareholders responsibility and a condition of consent that the metering equipment is accurately recording and transmitting data.

Regarding farm audits, Paul Reece is focusing on farms that have C Grades and supporting these farms and the changes required to get them to a B grade and compliant. Following the latest audit round, there is another three A Grades, some B+ Grades and one repeat C Grade which will have a re-audit.

The focus for WIL for the next few months is the submission to the Plan Change which involves a lot of different work streams. Also the solutions package to meeting the targets that are in the ZIPA.

B Walton noted there are some quite big pieces of work being undertaken and commented that there are challenges ahead for arable farmers as well as dairy farmers.

There is only 50 - 60% response rate a year from shareholders in providing Overseer files, with large variations in the outputs from Overseer and noted that this is not working for WIL at present. It is the primary tool and the only tool available for shareholders to use to track change and improvements over time and to track those reductions. There needs to be confidence in the nutrient budgets and consistency and WIL are considering options to achieve this.

G Edge asked if the problems with Overseer are being experienced throughout New Zealand. B Walton suggested that there needs to be a culture developed where the inputs methodology is the same for everyone and this is not being seen at present. If there was a panel or a single provider solution that this may help moderate that process.

3. **COMMITTEE UPDATES – MURRAY GRIFFIN, (CWMS FACILITATOR, ECAN)**

- 3.1 Land and Water Regional Plan Update – Jason Holland (ECan)
PowerPoint presentation provided at the 11 March committee meeting.

- 3.2 Waimakariri ZIPA 2018 – a correction

This was discussed at the Committee workshop recently and the correction is required in the ZIPA. It was confirmed that this incorrect figure was used only in the ZIPA document and the correct figure had been used in discussions with the water user groups.

C McKay noted that the correct information was provided by the Committee, and suggested that the letter advising of this correction should come from Environment Canterbury, with the support of the Zone Committee (rather than being signed by the Zone Committee Chairperson). Following discussion on this matter, this was agreed by all committee members and supported by S Rixecker.

Moved G Walton seconded C Latham

THAT the Waimakariri Water Zone Committee

- (a) **Confirms** that the proposed Cust River B block minimum flow presented in the Waimakariri ZIPA 2018 at 310L/s should be 350L/s. This correction still aligns with the committee's intention in setting minimums flows for the Cust River. It is requested letters informing those water users associated with the Cust River B block of this correction should be sent from Environment Canterbury with the support of Waimakariri Zone Committee.

CARRIED

3.3 Omnibus Plan Change 2019 – Andrea Richardson (ECan Senior Planner)

M Griffin provided an update on progress of the Omnibus Plan Change 2019. This update has been provided to all Water Zone Committees. By way of explanation, it was explained that Omnibus 2019 plan change will form one part (being Part A) of proposed Plan Change 7 to the Land and Water Regional Plan. Part B is a Waimakariri sub-region component and Part C is an Orari-Temuka-Opihi-Pareora sub-regional component.

G Edge asked what the major issues of the braided rivers are and what is the timeframe for the court decision likely to be? The issue is the interpretation of the width of braided river channels and S Rixecker said it is hoped to be in the court this year. S Rixecker advised that the Braided rivers topic, is going before the ECan Councillors this week, and following that, there will be brought out before the Committee for a briefing. The Chair noted that there was significant information in this document and suggested there needs to be time included for a presentation of this to the committee and asked if this could be brought before the May meeting of the committee. G Edge noted that the Waimakariri Zone Committee has not had the chance to provide input on this matter and believes that the Zone committee is entitled to have an opportunity to provide feedback. M Griffin said this would also have to occur at the May meeting and will follow up on this request. S Rixecker also advised that she update the committee on the statutory process before the May meeting

A Rueben commented that this was not presented earlier, as the Committee was part way through the draft ZIPA process and ECan were to present to the committee at a later date, but this hasn't occurred. He noted Christchurch-West Melton Zone Committee had also not had the opportunity to comment or provide feedback.

3.4 Immediate Steps Biodiversity Funding Overview – Murray Griffin (CWMS Facilitator – Waimakariri)

Lineside Road Drain Investigation

A Arps provided an update on this matter and there is investigations now underway. Both ECan and WDC have been doing some work in this area prior to the March meeting. The area is historically a very wet area. The area is used for grazing in the summer months but is often under water during winter and there is effectively a layer present with marine silts which don't allow the water to drain through, so it travels across the surface. A full update will be provided to the committee at the May meeting of the broader issue, with some drone footage. It was noted that the flood gates were open in the time reported and have been lifted since March and will allow some water movement twice a day. Where they are located, means that there is debris getting caught in the gates and this issue is being dealt with. A Arps commented that this issue could be something that is referred back to the Water Zone Committee as becoming part of a catchment action plan as there are a combination of environmental issues and land management issues happening here.

G Edge requested that a good map be included to show exactly where this drain is, and also to include how this drain fits in the District Council LIDAR data, referring to major storm events and how this impacts it. He added he would also like to clarify which sub-catchment this item could be included in.

Immediate Steps Overview

M Griffin spoke on the information provided in the Agenda on the Immediate Steps Funding and history of funds granted from 2011 – 2015. There was \$500,000 allocated to each Zone Committee to invest into biodiversity projects within this first five-year period. The second five years of funding, from 2016 through to June 2020, was also profiled. A Arps confirmed there is currently \$12,000 remaining in the budget for this financial year, which can still be applied for. Any applications for funding for this year need to be presented to the committee at the next meeting in May.

Chair D Ashby reminded the committee that the Immediate Steps funding is what this committee has fiscal responsibility for and there is good information available here on what projects the funds have been allocated for.

Following a question from Grant Edge on all the funds allocated in the first five years, 2011–2015, M Griffin said the funding would have been fully allocated for each project, but this showed \$28,042 was rolled over into the 2016 financial year. In general terms, A Arps advised that it is not ideal to have projects to go out over several years, which had happened in the past. This practice was not being encouraged now.

C Latham advised that Duncan and Tina Mackintosh of White Rock Mains are having a Field Day on Friday 10th May, commencing at 9.30am which may be of interest for members to attend. This property had received Immediate Steps Funding and recently won the Canterbury Ballance Farm Environmental Award.

J Roper-Lindsay asked if there was any record of the biodiversity gains from the projects that have received Immediate Steps funding over the past eight years. As a lot of these projects are located on private land, they are never seen and J Roper-Lindsay enquired if there was a record of the progress or success of projects. A Arps advised that each project has regular follow-ups, including those on private land. This is currently an audit being done on projects in the Christchurch West Melton Zone, and a similar audit will be undertaken in the Waimakariri Zone.

3.5 Media and Communications – 1–31 March Update – Gina McKenzie (Director – Real Communications)

G McKenzie spoke to her update which is included in the agenda and the newsletter. Currently she is doing some work on the Zone refresh process, working with the internal ECan communications team. She will also be doing a profile article on John Cooke, as a new committee member.

An upcoming project is an article on the wetlands of North Canterbury, which Gina will be doing with Andrew Arps.

M Blackwell sought clarification on the recent removal of the structures from the Cam River and had been asked by members

of the community why this work was undertaken in the breeding season. In response, A Arps advised that the contractors had been asked to delay their work and would get back to the committee to confirm the details.

M Griffin encouraged members to watch the movie produced by the Ashley Rakahuri Rivercare Group on the work undertaken by this group. G McKenzie added that this film highlights some of the outcomes of projects which had received IMS funding. J Roper-Lindsay and C Latham had attended the screening of this film at Rangiora Town Hall on 21 March.

3.6 Waimakariri Water Zone Committee 29 March eNewsletter

The March eNewsletter is included in the agenda.

Moved J Roper Lindsay seconded C McKay

THAT the CWMS Waimakariri Zone Committee:

- (a) The Zone Committee are asked to receive these updates for its information and regarding the committee's work programme and community engagement priorities for 2019.

CARRIED

4. PINES BEACH WETLAND AND TUHAITARA COASTAL PARK – UPDATE – GREG BYRNES (GENERAL MANAGER, TE KOHAKA O TUHAITARA TRUST)

G Byrnes acknowledged the commitment and support from this committee which has gone a long way towards the success of Tuhaitara since the start of the Immediate Steps Funding project. The support of other agencies and groups was also acknowledged. G Byrnes highlighted one of the earlier funding grants which was for animal pest control and the success of this, with a significant increase in the native bird population, primarily around Tutaepatu Lagoon and the Pegasus wetlands.

Using a map, G Byrnes indicated the increase in the size of the park, which is now almost 20% bigger than it was six years ago. Some of this was land purchased from the Todd Group, and in that time there has been approximately \$50,000 spent on weed control. There is currently eight volunteer trappers operating. G Byrnes spoke to a number of aerial photos and drone footage from different parts of the park and the planting and pest control work that has been undertaken in these different areas. Also with the work that has been undertaken on treating willows which are dying off, this allows natives to flourish. With the removal of both animal and plant pests, this has enabled the establishment of seed banks. Also with water and birds, there is a lot of propagating throughout the park, supporting the work that is being done. G Byrnes also advised that there are now two full-time rangers employed by the Trust.

There has been 3000 trees donated this year by "Trees that Count" and planting will commence in May in conjunction with Kaiapoi North School and the schools biota node project.

J Roper-Lindsay asked if there were any plans for interpretation in signage that could be put in along the pathway in the Park, to be of interest for all people visiting the park. Greg Byrnes spoke on a new innovation of signage, including videos, which is underway. This is a project being

worked on by the University of Canterbury, where places around the park have been identified to have signs which will have short videos or short messages. These will be a mix of environment, culture, recreation on the stories that can be told through these. Regarding new signs, these are also currently being produced, all bi-lingual which will be in place before Christmas. There are also plans underway for a cultural area to be established near Woodend Beach Road. Copies of a brochure were tabled, which provide information on over 90 different varieties of flora and fauna that are now found in the park.

G Byrnes noted following the logging of the forest area (completed in September/October 2018), the rainfall pre -Christmas, identified low lying areas for the 31 new biota nodes with capacity for 12 more to be established.

Chair Ashby thanked G Byrnes for his presentation.

Moved J Roper Lindsay seconded M Blackwell.

THAT the CWMS Waimakariri Zone Committee:

- (a) Receive this briefing for its information, and
- (b) Consider its ZIPA recommendations and 2019 work programme priorities.

CARRIED

5. WDC IMPLEMENTATION OF ZIPA – PROPOSED WDC ‘LAND AND WATER’ STEERING GROUP – SOPHIE ALLEN (WATER ENVIRONMENT ADVISOR, WDC)

S Allen (Water Environment Advisor, WDC) and G Cleary (Manager Utilities and Roading, WDC) presented this report.

S Allen spoke on the proposal to have a Land and Water Steering Group at Waimakariri District Council. This group will have a membership of both elected members, the Mayor and Councillor holding the Water portfolio, plus Council staff. It is also proposed that a representative from the Zone Committee be appointed to this Steering Group in an advisory and endorsing role. This Steering Group will report to Council. It was pointed out that this is a draft proposal to go to the Council's Annual Plan seeking the approval of Council.

Judith Roper-Lindsay questioned the reporting lines of this steering group and whether there could potentially be doubling up with the operational Project Control Group. G Cleary provided clarification on the difference between the Steering Group and the Project Control Group and how these would work together.

G Edge suggested that there could be collaboration with the ECan scientists

C McKay provided feedback and expressed some concern about naming of this group. Noted there would be more value and synergy in the Zone Team Manager appointed to the group, rather than a Councillor.

Arapata Rueben suggested that there wouldn't be the need for both a Manager and Councillor on the group.

The next step is awaiting feedback from the draft annual plan and it was agreed that this will be taken to the WDC and then back to the Zone Committee.

Moved C Latham seconded G Edge

THAT the CWMS Waimakariri Zone Committee:

- (a) **Receive** this draft proposal from WDC staff for creation of a 'Land and Water' steering group to oversee the implementation of the WDC components of the Zone Implementation Programme Addendum (ZIPA).
- (b) **Provide** feedback on the proposed creation of a 'Land and Water' steering group, including representation of a member of the Waimakariri Water Zone Committee on the steering group.

CARRIED

6. GENERAL BUSINESS

The Chair spoke to the draft Annual Report of the Zone Committee which has been provided to all members. Members were all encouraged to provide any feedback, or comments on this.

Councillor McKay suggested mention should be made of the other meetings attended by members of the public during the ZIPA consultation programme, not just the meeting at Ohoka.

Chairman Dave Ashby would like to see included in this Annual Report, that the ZIPA for this zone is one of the most challenging of all the Zones, including 93 recommendations. This has not been a "business as usual" year, and this needs to be acknowledged. There also needs to be included mention of the significant number of workshops that have been held through the year.

C Latham suggested inclusion of information on the formation of the Next Generation Farmers Group, and the benefits of having ongoing relationship with members of this group.

KARAKIA

Arapata Rueben provided the karakia to close the meeting.

There being no further business, the meeting closed at 5.30pm.

NEXT MEETING

The next meeting of the CWMS Waimakariri Water Zone Committee will be held on Monday 13 May 2019 commencing at 3.00pm.

CONFIRMED

Chairperson

Date

7 **WORKSHOP – WWZC 2019 WORK PROGRAMME PRIORITIES REVIEW**

Unconfirmed

AGENDA ITEM NO: 3	SUBJECT: Denitrification Wall pilot study in Silverstream Reserve – update	
REPORT TO: Waimakariri Water Zone Committee		MEETING DATE: 13 May 2019
REPORT BY: Murray Griffin, CWMS Facilitator – Waimakariri, ECan		

PURPOSE

To provide the Water Zone Committee with an update on a pilot field study of a denitrification wall being conducted in Silverstream Reserve.

BACKGROUND

The Institute of Environmental Science & Research (ESR) is a Crown Research Institute, wholly owned by the NZ Government. One of the Institute's undertakings is scientific research aimed at improving the safety of freshwater and groundwater resources. Examining the fate and transport of nitrate in NZ groundwater systems has been a key topic of ESR's groundwater research over the last decade. We have found that NZ's alluvial gravel aquifers have negligible ability to naturally attenuate nitrate and, in many locations, groundwater systems have reached the limit of mitigating nitrate pollution through natural dilution. To remedy this and to provide potential means for farming within water quality limits, ESR is researching and developing a way to enhance denitrification of groundwater.

One ESR approach uses an underground 'denitrification wall' tailored to gravel aquifer systems. The intention is to make a reliable assessment of whether such technologies represent a viable nitrate mitigation option. We have reached a stage where the next step in our scientific assessment is to conduct a pilot study whereby we will construct a denitrification wall and make direct long-term study of it under field conditions.

In 2017 Silverstream Reserve was identified as a good field study location in the Waimakariri Water Zone. This briefing will provide an update on this field study.

- For a more detailed overview on this pilot field study please refer to agenda item 3-1.

WHO

This update will be provided by:

- Lee Burberry – Senior scientist within ESR's groundwater team and
- Murray Close – Principal scientist within ESR's Water, Waste and Social Systems Group

RECOMMENDATION

- That the committee receive this update with consideration to the implementation of the Waimakariri Land & Water Solutions Programme.

Testing Woodchip Denitrification Wall Technology in a Shallow Gravel Aquifer

Lee Burberry¹, Richard Mellis²,
Phil Abraham¹, Mike Finnemore²,
Murray Close¹

¹ Institute of Environmental Science & Research Ltd. (ESR),
Christchurch, New Zealand
² Southern Geophysical Ltd., Christchurch, New Zealand

Background

- ▶ Alluvial gravel aquifers are the most important groundwater systems in NZ.
- ▶ Their ability to assimilate nitrate impacts is limited by a lack of electron donors to promote denitrification reactions.
- ▶ Woodchip denitrification walls are a proven passive, in situ remediation technology for treating nitrate in shallow groundwater^{1,2}.
- ▶ Whilst known to be effective in sandy aquifers, how they might perform in fast-flowing, heterogeneous alluvial gravel aquifers is yet to be investigated.
- ▶ We are making a practical test of a woodchip denitrification wall in a shallow alluvial gravel aquifer, at Silverstream Reserve, North Canterbury.
- ▶ Hydrogeological conditions at the study site have been characterised.
- ▶ A woodchip denitrification wall was installed in November 2018 and its performance continues to be monitored.
- ▶ The aim is to assess whether woodchip denitrification walls might be a viable "end-of-pipe" nitrate-mitigation tool, for reducing N-loads in the NZ hydrosphere.

Site Characterisation

- ▶ Holocene alluvial sand and gravel outwash deposits from the Waimakariri River.
- ▶ Underlying silt layer circa. 5 m below ground.
- ▶ Water table within 50 cm of ground surface.
- ▶ Piezometric gradient of 0.002.
- ▶ General north-east groundwater flow direction.

Figure 1. Composition of the shallow alluvial gravel aquifer at the study site, as seen in a core from one of the 50 investigative bores drilled at the site using sonic-drilling methods. The unconfined aquifer rests upon an extensive silt layer that is circa. 5 m below ground level and marks the base of the Christchurch Formation. Sandy gravel logged below the silt marks the top of the confined Riccarton Gravel aquifer unit. Yellow numbers indicate groundwater nitrate concentration (mg NO₃-N/L) as measured from discrete facies.



- ▶ Time-lapse electrical resistivity tomography (ERT) hydrogeophysical method used to determine precise groundwater flowpaths and true velocity.
- ▶ Groundwater and nitrate fluxes appear to be focussed through preferential flow channels formed from interconnected open framework gravel facies.
- ▶ Denitrifying enzyme assays confirmed no active denitrification in gravel facies.
- ▶ Background nitrate in saturated gravel facies is 6-7 mg NO₃-N/L.
- ▶ Nitrate-nitrogen mass flux per unit strip of shallow aquifer circa. 24 kg/m/yr.

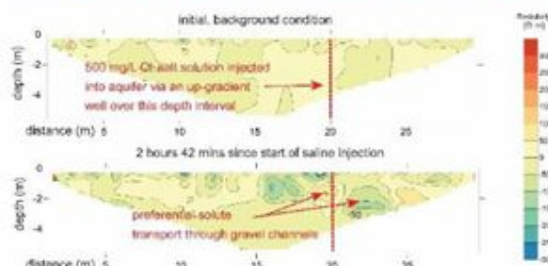


Figure 2. Example ERT profile, surveyed perpendicular to groundwater flow direction, 5 m down-gradient from a well where 0.08% saline solution was injected across the full saturated thickness of the shallow aquifer. Time-lapse imagery shows flow is focussed through stacked beds of open gravel. First-moment centre of mass calculations suggest velocity in these beds ranges 40-50 m/day.

Wall Design & Construction

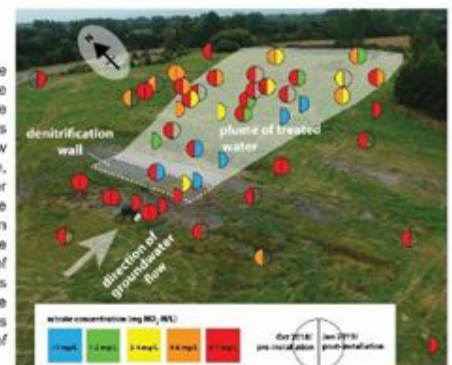


Figure 3. Finishing emplacement of reactive woodchip/gravel mixture into the first cell of the denitrification wall, which is oriented perpendicular to the direction of groundwater flow (from the left in the photo). The 50/50 binary mixture of wood and gravel was prepared on a volumetric basis and deposited into a dry excavation. Note: the sheet-piling was removed once the cell was filled. Denitrification wall dimensions are marked.

- ▶ Experimental wall comprises two separate but adjoining cells - each 12.5 m long x 5 m wide x 3 m deep.
- ▶ Sheet-piling required to stabilise excavation walls, which enabled dewatering, yet added significantly to construction cost.
- ▶ 50/50 (vol./vol.) woodchip/gravel mixture¹.
- ▶ Cell1 = 'chipped' radiata pine wood / 20-30 mm gravel rounds.
- ▶ Cell2 = 'hogged' radiata pine & macrocarpa wood/well-graded aggregate dug from the site, screened of material under 20 mm.
- ▶ Materials mixed and emplaced under dry conditions.
- ▶ Material and processing costs: NZ\$17,000 woodchip + NZ\$68,500 excavation and gravel processing + NZ\$100,000 sheet-piling.

Results

Figure 4. Image of the 3.5 ha study site showing nitrate concentrations measured in shallow groundwater, before, and 8-weeks after installation of the woodchip denitrification wall. The approximate extent of the plume of treated groundwater is marked as far as the site boundary that is 230 m down-gradient of the treatment wall.



- ▶ Denitrification wall is so far proving effective at filtering nitrate from shallow groundwater.
- ▶ No significant increase in either ammonia or nitrite tends to indicate heterotrophic denitrification likely the main reaction process.
- ▶ Altered redox state has mobilised heavy metal elements (e.g. iron, manganese and arsenic) from the greywacke sediments.
- ▶ Impacts that exceed drinking water quality standards do not extend more than 50 m down-gradient from the wall.

References:

1. Schmitt C. A. and Clark M. R. (2012). Evaluation of a denitrification wall to reduce surface water nitrate loads. J. Environ. Qual. 41:726-734.
2. Schreyer L. and Ferguson G. (2008). Nitrate removal from groundwater using a denitrification wall anchored with sheet-pile. J. Environ. Qual. 37:944-950.
3. Burberry L. J., Abraham P., and B. (2014). Determining the hydraulic properties of woodchip-gravel mixtures for use in denitrifying walls. J. Hydrol. NZ 52 (1): 5-11.

AGENDA ITEM NO: 4	SUBJECT: WDC waterway consent application – briefing	
REPORT TO: Waimakariri Water Zone Committee		MEETING DATE: 13 May 2019
REPORT BY: Murray Griffin – CWMS Facilitator, Waimakariri		

PROPOSAL

This briefing provides the Waimakariri Water Zone Committee with a summary of the WDC waterway consent application. The draft application is informed by the recommendations of the Aquatic Ecology Ltd (AEL) District fish survey report, which has been previously circulated for information.

The recommendations from the AEL report regarding restrictions on drain maintenance both spatially and temporally have been included in the draft consent application conditions. Also included is a requirement to re-visit the fish survey on a five yearly cycle

It is proposed that consideration of the AEL report recommendations not directly relevant to the consent application be considered at the August meeting of the Committee

RECOMMENDATIONS

That the Zone Committee:

- (a) **Receives** this report for review,
- (b) **Provides** feedback on this draft consent application.

BY WHO

This briefing is provided by **Simon Collin – WDC Infrastructure Manager, 3 Waters Team**

AGENDA ITEM NO: 5	SUBJECT: Committee Updates
REPORT TO: Waimakariri Water Zone Committee	MEETING DATE: 13 May 2019
REPORT BY: Murray Griffin, CWMS Facilitator – Waimakariri, ECan	

PROPOSAL

This agenda item provides the committee with an overview of updates for review.

RECOMMENDATIONS

- The Zone Committee are asked to receive these updates for its information and regarding the committee's work programme and community engagement priorities for 2019.

COMMITTEE UPDATES

The following updates are tabled for the committee:

1. CWMS Regional Committee

The last Regional Committee meeting was held on Tuesday 9 April. Summary notes from this meeting are provided by Carolyn Latham as **agenda item 5–1**.

The next Regional Committee meeting will be held on Tuesday 14 May.

The link to the CWMS Regional Committee papers is provided below:

<https://ecan.govt.nz/data/document-library/?Search=regional+water+management+committee%2C+agenda&documentTypes=-1&pageSize=12&start=1&sortDir=desc>

2. Media and Communications – April 2019

A media and communications report for the month of April is provided by Gina McKenzie as **agenda item 5–2**. The latest zone committee eNewsletter (29 April) is provided as **agenda item 5–3**.

3. Lineside Drain investigation

Initiated at the March zone committee meeting, following the presentation by Michael Bate, investigations into this issue are now underway and an update is provided as **agenda item 5–4**.

4. Zone Committee refresh 2019

Given the local government elections in October this year, and the scheduled mid-year notification of the Waimakariri sub-region plan change, the zone committee refresh will be conducted in May and June.

More information on the refresh will be available later in the month, with expressions of interest to be on the Waimakariri Water Zone Committee received from –
Monday 29 April to Friday 31 May.

For more information please go to: <https://www.ecan.govt.nz/your-region/your-environment/water/whats-happening-in-my-water-zone/join-your-local-water-management-zone-committee/>

Or contact Waimakariri Water Zone Committee Facilitator, Murray Griffin:
murray.griffin@ecan.govt.nz
(027) 705-4798 or 0800 324-636

CWMS Regional Committee Meeting 12th April 2019

1. General Business

- The resignation of community member Nicky Hyslop was noted.
- A refresh of the community members of the committee is proposed early 2020.
- A meeting of Zone Committee Chairs and Deputy Chairs is proposed for July. This will include a briefing on the recommendations from the Fit For Future project commissioned by the Mayoral Forum.
- Ecan is looking into the possibility of holding another Watershed event.
- On 14th May a follow up workshop will be held to continue discussion on the future work programme of the committee.
- Following the above workshop there will be a farm field trip to look at an FEP in action. Zone committee members will be invited to the field trip.

2. CWMS Fit for the Future Project – The committee provided feedback on the final draft of 2025/2030 goals and work programmes. Following discussion on a range of matters, the committee agreed to recommend that the proposed CWMS goals be forwarded to Canterbury Mayoral Forum. It was agreed the Chair would re-draft recommendations associated with the goals programmes, strategic issues, and key messages to the Mayoral Forum and email to the committee for feedback. The final report will be presented to the Mayoral Forum on 24th May 2019.

3. Fishscreen Technical Working Group Report – Refer to agenda for full report. While the mandate was to review the NIWA fish screen guidelines and LWRP schedule 2, the working group identified that the standard and effectiveness of fish screens across Canterbury is quite poor. It was considered that tidying these up could make quite an improvement therefore compliance should be prioritised. It was agreed to draft a letter to Ecan recommending that this be a focus.

4. Zone Update

- OTOP – Are now having a strategy session on where to next following the preparation of their ZIPA.
- Banks Peninsula – Have developed a biodiversity plan for action.
- Kaikoura – MPI projects are progressing post-earthquake on the plains. Engineering works in Lyall Creek have enabled the return of inanga by increasing water levels to allow for hatching of eggs.

5. Annual Report - several suggestions to better reflect the work of the committee were to be incorporated into the current draft (attached).

6. Location of Agenda Papers:

<https://www.ecan.govt.nz/data/document-library/?Search=regional+water+management+committee%2C+agenda&documentTypes=-1&pageSize=12&start=1&sortDir=desc>

Carolyne Latham
Waimakariri Water Zone Committee RC Rep

AGENDA ITEM NO: 5-2	SUBJECT: Media and Communications Report – April 2019
REPORT TO: Waimakariri Water Zone Committee	MEETING DATE: 13 May 2019
REPORT BY: Gina McKenzie, Real Communications	

Waimakariri Zone Committee Media and Communications Report -1st April– 30th April

Monthly newsletter

- 29th April – newsletter sent out to 1000 + subscribers – Focus on encouraging community members to apply for zone committee roles

Articles provided to media

- Profile on Michael Blackwell – reasons for joining the zone committee – used for WZC refresh material
- Profile on Dave Ashby – reasons for joining the zone committee – used for WZC refresh material
- Opinion pieces x2 from Dave focusing on zone committee priorities for the next 3 months
- News brief on zone committee refresh

Articles published (articles supplied and articles of interest to the committee)

**** denotes content provided to media**

- 28 March 19 - <https://www.stuff.co.nz/the-press/news/north-canterbury/111608738/dangerous-illegal-whitebait-stands-removed-from-north-canterbury-river#comments> (article missed from March report)
- 3rd April – Northern Outlook – Black backed gull cull to continue on braided rivers in Canterbury.
- **4th April – North Canterbury News – Illegal structures removed from Cam River
- 18th April – North Canterbury News – Could bore water be making you sick? Over 50 000 private wells registered with ECan, but no testing required.
- 18th April – North Canterbury News – permanent fire ban for Tuhaitara Coastal Park to protect wildlife and native plants
- ** 25th April – North Canterbury News – opinion piece from Dave Ashby regarding WZC focus areas and progress update.

Upcoming articles

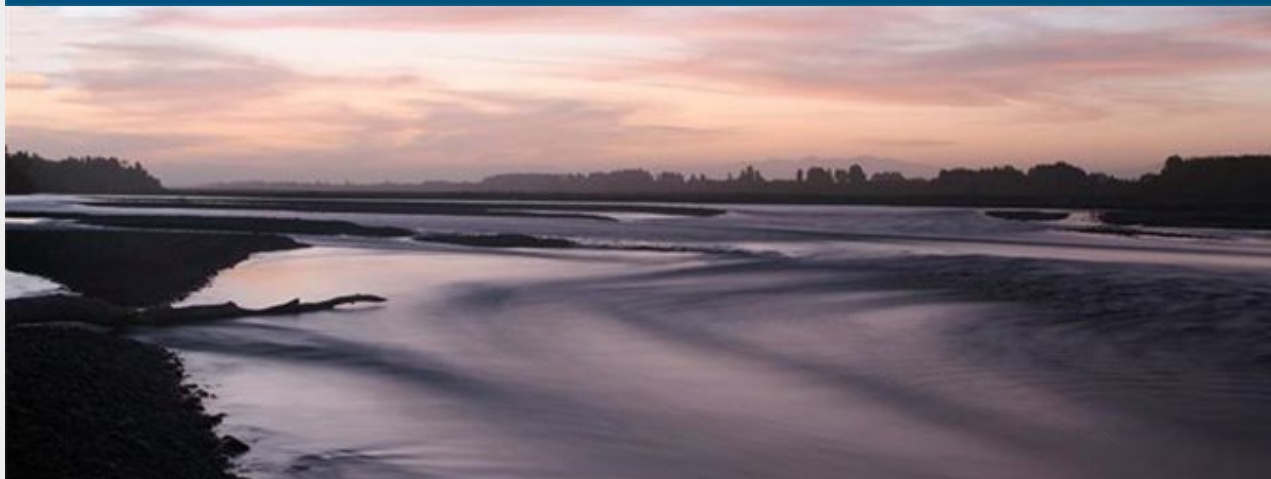
- Pines Beach wetland article
- Profile on John Cooke – new WZC member
- Opinion piece – Andrew Arps

- North Canterbury wetlands – feature article

Current cinema advertisement

- Everyone has a part to play – bridging the rural-urban divide

Waimakariri Water Zone Committee



Wai, do you care?

We're looking for new zone committee members to join us and I thought I'd share my own personal "wai" for joining the committee with you this month. If you're keen to be part of the Waimakariri Zone Committee visit this [website](#) before 3 June and let us know wai you care.

As a dairy farmer and farm environmental consultant, I joined the Waimakariri Water Zone Committee to encourage fellow farmers to consider the environment when making decisions on-farm.

I wanted to get stuff done and could see that we all had a part to play in improving our local streams and waterways. Being a farmer myself, I felt I could motivate other farmers to prioritise the environment.

I've been a member of the committee for five years and have chaired the committee since March 2017. During that time, I've experienced both challenges and progress when it comes to local waterways.

We've had plenty of tough decisions to make where different groups of people want different outcomes. It has been a balancing act and putting together the Zone Implementation Programme Addendum (ZIPA) recommendations has been one of the most challenging things I've ever worked on.

We've also seen progress and improvements, especially by working collaboratively with groups like Waimakariri Irrigation Limited (WIL), Waimakariri District Council (WDC), the Next Generation Farmers Group, the Institute of Environmental Science and Research (ESR), along with community groups and hundreds of residents who have attended our meetings and workshops.

I believe that collaborative projects such as the Silverstream infiltration trial with WIL, denitrification wall with ESR, workshops with the Next Generation Farmers Group, Ashley-Rakahuri River enhancement project with the Ashley Rakahuri Rivercare Group (ARRG)

and the Tūtaepatu wetland project with the Tūhaitara Trust are the key to creating real change.

Working with these groups has helped us make rapid progress on projects where we can clearly see the impact of our Immediate Steps (IMS) funding.

It's an exciting time to be part of the committee with a focus on improving local waterways through priority catchment areas which are likely to include Silverstream, the Cam River tributaries and Saltwater Creek.

If you want to improve our waterways, put your hand up to be involved. Our next committee meeting is on Monday 13th May from 3pm – 6pm at the Waimakariri District Council Chambers. I hope to see you there.

FEP assistance at Waimakariri workshop

Beef and Lamb New Zealand (B+LNZ) will host an FEP workshop for Waimakariri farmers on Thursday 13th June from 10am – 3pm. The free workshop, facilitated by agricultural consultant Carolyne Latham, will help farmers create a plan which allows them to remain productive while addressing environmental and water quality issues on-farm.

Attendees will use B+LNZ's FEP toolkit to assess the impact of their farm on the environment and will then put strategies in place to mitigate risk.

This workshop is a great opportunity for farmers to get industry support for their FEP if they need to apply for a farming land use consent under the following conditions:

- Farmers who irrigate more than 50 hectares, and
- Farmers who have roughly more than 10% of their property in winter grazing with cattle

To help create a personalised plan, please bring along two copies of your farm map/aerial photo and an Overseer nutrient budget (if available). Lunch will be provided, and registrations are essential.

To register please click [here](#). For more information click [here](#).

Open day provides winning insight

Learn how focusing on animals, the environment and people helped Duncan and Tina Mackintosh of White Rock Mains win the Canterbury Balance Farm Environmental Awards at an open day on Friday 10th May from 9:30am.

The couple, who are the fourth generation to farm the sheep, beef and dairy support property, took out the 2019 Regional Supreme Award for Canterbury. Judges praised their determination to protect the environment, and their sense of community spirit. They have a 91-hectare QEII covenant on their farm and Tina supports North Loburn School's award-winning garden-to-table programme.

Join the open day at White Rock Mains, 1363 Loburn Whiterock Road, RD 2, White Rock, Rangiora. For more information please contact Kaylene Fenton of Beef and Lamb New Zealand [here](#).



Illegal structures removed from Cam River

Ten illegal structures have been removed from the Cam River by Environment Canterbury following calls from residents concerned about the danger posed by the structures.

Several people voluntarily removed their structures after receiving notices from consents officers, while three people applied for consents for their structures before the deadline of 31st January.

North Canterbury zone manager Andrew Arps says he's pleased with the positive response received from most users and owners of the structures, some of which have been in the Cam River for over 30 years.

"Most people understand that everyone needs to be able to use the river safely for recreation and many of the structures would give way if someone stepped on them.

"The remaining 10 to 15 structures will be removed within the next two weeks, while those awaiting resource consent decisions will remain intact until a decision is reached."

Mr Arps says the structures were also impeding enhancement projects to improve the flow of the Cam River.

"The Cam River is an important focus for the Waimakariri Zone Committee, local council and environmental groups. We want to ensure a positive outcome for the projects which include sediment removal, bank re-shaping, wetland drainage and bank raking. Our aim is to create a safe river which can be used by all residents and visitors."



An illegal structure being removed from the Cam River in March.

For more information on the Waimakariri Water Zone Committee or the Canterbury Water Management Strategy, please email North Canterbury Zone Manager [Andrew Arps](#).

For more information visit ecan.govt.nz/water

The Waimakariri Water Zone Committee is a
community led committee supported by councils.

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AGENDA ITEM NO: 5–4	SUBJECT: Lineside Road drainage and wetland – update
REPORT TO: Waimakariri Water Zone Committee	MEETING DATE: 13 May 2019
REPORT BY: Andrew Arps, Northern Zone Manager, ECan	

Update on Lineside Road drainage/wetland issue

- The area has been investigated by both Environment Canterbury and WDC prior to it being raised/highlighted at March's zone committee meeting

History – long-term and recent

- Flaxton is historically a wet, swampy area. Between 1869 and 1872, there were 17 flax mills created in North Canterbury, with two of these located between Flaxton and Ohoka.
- The area was once known as the Rangiora swamp. The 4000-acre swamp was drained around 1860. This dried the land and lowered the level of the ground by as much as eight feet in places.
- The site was a traditional mahinga kai gathering area for Ngai Tahu and is of cultural significance.
- In recent years, (over the last 30 years) many of the larger farms in the Flaxton area have been subdivided into 20 and 10-acre lifestyle blocks.

Broader background of the area

- The area is used for stock grazing during the warmer months but is often underwater during the winter months as they act as impervious flood detention basins. Therefore, the land is not usually irrigated or used for intensified purposes (i.e. winter greenfeed crops). The area is predominantly used for summer (grain) cropping or extensive summer grazing land.
- The area is a detention basin and regularly floods. The land is comprised of impermeable marine silts and the only way that water can escape is over the surface of the land.
- The wetland represents a subset which is indicative of broader issues in the area. These issues are potentially caused by a combination of land management and environmental issues. The area may have dropped further after the earthquakes but has always been seasonably wet.
- The area is mapped as a wetland using with ECan using Google Earth as a reference (see attached map).

Specific information on drain

- The Kaiapoi River floodgates were not fully closing and were letting water flow upstream on incoming tides, and out to the river on falling tides. This generated a small twice daily flow regime to the drain that at this time of year is otherwise usually static or stagnant.
 - This was discussed with river engineers and they informed that the floodgates were overhauled in the last couple of years (new seals installed etc.)
 - However, these floodgates are prone to getting material (sticks, logs, old bikes etc.) stuck under them and jamming them open, so need to be checked regularly.
 - They were to winch them up to clear them in late April
- There was clear water flowing upstream from the Kaiapoi River for 30-40 metres and then the drain abruptly became very turbid with bright yellow suspended sediment for a long way upstream. At the time the upstream sediment source was not identified, but the clarity was poor, and the sediment was an unusual colour.
- The Waimakariri River has been flowing at extreme low flows (24 cumecs) over last week (end of March), and the water flowing into Lineside Drain from the Kaiapoi River was slightly brackish/salty (from a simple 'taste' test). This will have an additional bearing on the vegetated state as salt will stunt or kill many aquatic plants at the most accessible lower end of the drain. This may further explain why there is an abrupt 'front' between the inflowing 'Kaiapoi River water' and the upstream silty water in Lineside drain.
- Lineside Road Drain is a drainage system that is primarily fed by land runoff (rainfall and water logged soil) rather than being fed by groundwater springs like its neighbouring catchments (Cust #7 drain and the South Branch of the Cam). Any springs that flowed from this area are likely to have been historically diverted into #7 Drain or South Branch, although this area is largely overlying marine sediments with the groundwater diving underneath and passing out to sea. It therefore acts as a drainage outlet from an impervious water detention basin rather than as a spring-fed (groundwater-fed) stream.
- As Lineside Drain has not identified as a perennial flowing "spring-fed stream", it has not been routinely sampled for water quality or sediment. The drain acts as a drain for the extensive area of land between Lineside Road and Flaxton Road and between Lineside Road and Revells Road.
- At present there are some paddocks of cereal stubble currently supporting large flocks of Canada Geese. Other areas are highly grazed seasonally wet pastures, so therefore somewhat "peaty" or "clayish" in nature. Not surprisingly the runoff from this area therefore includes a lot of soil or sediment, and discoloured water as a result of the considerable amounts of organic material. The area will also generate iron flocs (Iron bacteria). This will all settle or become mobilised in the drain beds giving rise to perceived poor water quality.

Possible options/approaches

- Routine water quality “sampling” of this waterway isn’t recommended as we can predict, or expect, “poor” water quality, but feel we need to:
 1. Be more vigilant of managing the floodgate backflow issue
 2. Explain some of the sediment transport issues from the tidal washing (the leaking floodgate)
 3. Explain some water quality issues that may suppress weed growth (the backflowing Kaiapoi water being brackish)
 4. Expect levels of sedimentation, organic matter, and algae/iron flocs.
 5. Explain the bright yellow sediment sources through the lower drain network
- It is also important to point out that the Lineside Drain floodgates and drain are:
 1. Easily accessible, and on a major transport route
 2. In an area of high recreational use of the Kaiapoi River (whitebaiting, fishing, walking etc.)
 3. Alongside a signposted “ADOPT-A-HIGHWAY” stretch that is listed as a “Keep Rangiora Beautiful Project” which has extensive signage and native plantings. The drain habitat of Lineside Drain is not in keeping with the planted and maintained roadside theme.
 4. After Lineside Road Drain passes west underneath the railway-line it then follows alongside a well-maintained Council constructed tar-sealed cycleway and walking track. Again, a high public use/profile asset that will increase public scrutiny of parts of this drain/waterway.
- Therefore, despite not being a freely flowing groundwater fed stream, Lineside Drain is not an isolated, invisible, or insignificant land drainage canal. It should be considered part of the other significant district/zone spring-fed stream and drain networks that needs to be maintained/improved for instream values, because of its connections to the Kaiapoi River and public accessibility/conspicuousness.
- Therefore, this catchment is worthy of more scrutiny of land-use practices including stock access, buffers to reduce sediment runoff, and appropriate seasonal land-use practices.
- WDC are sending another drone up for comparison with previous imagery.
- WDC will ensure their drains are maintained.
- We need a map of the wetland as owners need to keep stock out of wetland as per regional rules.

What are the ZC's thoughts/ideas/suggestions?

- This issue is broader than the original issue raised at the March meeting. Is the issue best addressed as part of a Catchment Management/Action plan?
- To be discussed at the May Zone Committee Field Trip.