WAIMAKARIRI
DISTRICT COUNCIL

Utilities and Roading Committee

Agenda

Tuesday 21 June 2022

3:30pm

Council Chamber
215 High Street
Rangiora

Members:

Cr Robbie Brine (Chairperson)
Cr Al Blackie
Cr Sandra Stewart
Cr Joan Ward
Cr Paul Williams
Mayor Dan Gordon (ex officio)

The Chairperson and Members
UTILITIES AND ROADING COMMITTEE

A MEETING OF THE UTILITIES AND ROADING COMMITTEE WILL BE HELD IN THE COUNCIL CHAMBER, RANGIORA SERVICE CENTRE, 215 HIGH STREET, RANGIORA ON TUESDAY 21 JUNE 2022 AT 3.30PM

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

BUSINESS

Page No

1 APOLOGIES

2 CONFLICTS OF INTEREST

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

3 CONFIRMATION OF MINUTES

3.1 Minutes of a meeting of the Utilities and Roading Committee held on Tuesday 17 May 2022

6 - 11

RECOMMENDATION

THAT the Utilities and Roading Committee:

(a) **Confirms** the circulated Minutes of a meeting of the Utilities and Roading Committee held on 17 May 2022, as a true and accurate record.

3.2 Matters arising

4 DEPUTATION/PRESENTATIONS

Nil.

5 REPORTS

5.1 May 2021, December 2021 and February 2022 Flood Events – Service Requests Update – E Klopper (Flood Team Lead), C Fahey (Water Operations Team Leader) and K Simpson (3 Waters Manager**)**

12 - 20

RECOMMENDATION

THAT the Utilities and Roading Committee:

(a) **Receives** report No. 220609098129.

(b) **Notes** that 598 drainage service requests were received related to the significant rainfall events in May 2021, December 2021 and February 2022, which have all been responded to although approximately 138 requests require further maintenance or investigation work.

(c) **Notes** that there are currently 61 drainage assessments identified and this is likely to increase as the service requests are worked through.

Progress made since the previous Utilities & Roading Committee meeting is set out in Section 4 and is supported by the weekly update memos.

(d) **Notes** that background information in regards to the recent flooding event can be viewed in report No. 220310034384 entitled: "*February 2022 Flood Event - Update on Service Requests*".

(e) **Notes** that a webpage has been set up on the Council's website to provide updates on the status of drainage works underway and targeted information will be sent out to the Waikuku Beach and Kaiapoi communities.

URL:https://www.waimakariri.govt.nz/services/water-services/stormwater/drainage-works

(f) **Notes** that additional budgets for the Swindells Road Drainage Upgrade and Broadway Ave Drainage Upgrade projects in Waikuku Beach and High Street Drainage Upgrade project in Oxford have been approved for inclusion in the 2022/23 Annual Plan.

(g) **Circulates** this report to the Council and community boards for information.

5.2 Avian Botulism Management 2021-22 – S Allen (Water Environment Advisor) and K Simpson (3 Waters Manager)

21 - 43

RECOMMENDATION

THAT the Utilities and Roading Committee:

(a) **Receives** report No. 220420060318.

(b) **Notes** the low bird death numbers (48 birds) for the 2021-22 season at coastal Waimakariri District Council wastewater treatment plants (WWTPs), as collected by contractors to check for and contain any avian botulism, with no avian botulism outbreak detected.

(c) **Notes** the production of an updated WDC Avian Botulism Management Plan Version 2, which outlines current management practices, and adds changes from an SPCA review.

(d) **Notes** that Christchurch City Council responded to an avian botulism outbreak at the Bromley Wastewater Treatment Plant in the summer of 2021-22.

(e) **Circulates** this report to the Council, the Waimakariri Water Zone Committee, and the Community Boards for information.

5.3 Midge Management and Monitoring at Wastewater Treatment Plants – S Allen (Water Environment Advisor) and K Simpson (3 Waters Manager)

44 - 57

RECOMMENDATION

THAT the Utilities and Roading Committee:

(a) **Receives** Report No. 220511075308.

(b) **Notes** the use of the larval disruption dredging and oil surfactant spreading techniques that have been trialled at Kaiapoi and Woodend Wastewater Treatment Plants (WWTPs) for midge management.

(c) **Notes** that midge trap monitoring was not able to demonstrate if trialled management techniques reduced midge densities, however anecdotal evidence from neighbours supports continued use of the practises.

(d) **Notes** the cost of midge management for Kaiapoi and Woodend WWTP is estimated to have been approximately $30,000 for the 2021-2022 season, sourced from existing operational budgets, and is subsidised by avian botulism inspections that means that ecological contractors are already on-site to carry out midge trap monitoring.

(e) **Notes** that native planting and bunding is intended to be installed at the Woodend WWTP on the western boundary to replace pine forest screening that has been removed by logging, however the supply of bund material from construction of a Stormwater Management Area has been delayed.

(f) **Notes** the intended approach of submitting a new insect control management plan for Kaiapoi Wastewater Treatment Plant, focusing on non-insecticide control methods, to Environment Canterbury as a condition of consent CRC041049.

6 REPORTS FOR INFORMATION

6.1 **Approval to install two cattle stops on Carleton Road, between Harewood Road and Woodstock Road –** (report No. 220526085607 to the Oxford-Ohoka Community Board meeting of 8 June 2022 58 - 67

6.2 **Waikuku Beach Drainage Investigations Update –** (report No. 220602094304 to the Woodend-Sefton Community Board meeting of 13 June 2022 68 - 118

RECOMMENDATION

THAT the Utilities and Roading Committee:receives the information in Items 6.1 and 6.2.

7 PORTFOLIO UPDATES

7.1 **Roading – Councillor Paul Williams**

7.2 **Drainage and Stockwater – Councillor Sandra Stewart**

7.3 **Utilities (Water Supplies and Sewer) – Councillor Paul Williams**

7.4 **Solid Waste– Councillor Robbie Brine**

7.5 **Transport – Mayor Dan Gordon**

8 QUESTIONS UNDER STANDING ORDERS

9 URGENT GENERAL BUSINESS

10 MATTERS TO BE CONSIDERED WITH THE PUBLIC EXCLUDED

Section 48, Local Government Official Information and Meetings Act 1987

RECOMMENDATION

THAT the public be excluded from the following parts of the proceedings of this meeting.

The general subject of each matter to be considered while the public is excluded, the reason for passing this resolution in relation to each matter and the specific grounds under section 48(1) of the Local Government Official Information and Meetings Act 1987 for the passing of this resolution, are as follows:

Item No	Minutes/Report of:	General subject of each matter to be considered	Reason for passing this resolution in relation to each matter	Ground(s) under section 48(1) for the passing of this resolution
10.1 – 10.2	Reports from Management Team meetings	Reports for information	Good reason to withhold exists under Section 7	Section 48(1)(a)

This resolution is made in reliance on section 48(1)(a) of the Local Government Official Information and Meetings Act 1987, and the particular interest or interests protected by section 6 or section 7 of that Act which would be prejudiced by the holding of the whole or relevant part of the proceedings of the meeting in public are as follows:

Item Nº	Reason for protection of interests	Ref NZS 9202:2003 Appendix A
10.1 – 10.2	Protection of privacy of natural persons To carry out commercial activities without prejudice	A2(a) A2(b)ii

CLOSED MEETING

See Public Excluded Agenda (separate document)

OPEN MEETING

NEXT MEETING

The next meeting of the Utilities and Roading Committee is scheduled for 3.30pm, on Tuesday 19 July 2022.

BRIEFING

At the conclusion of the meeting, staff will present the following briefings:

- *Finished Floor Level Technical Practice Note – 30 minutes*
- *Wastewater Treatment Consenting and Compliance – 30 minutes*

WAIMAKARIRI DISTRICT COUNCIL

MINUTES OF THE MEETING OF THE UTILITIES AND ROADING COMMITTEE HELD IN THE COUNCIL CHAMBER, RANGIORA SERVICE CENTRE, 215 HIGH STREET, RANGIORA ON TUESDAY 17 MAY 2022 COMMENCING AT 3.30PM.

PRESENT

Councillor P Williams (Chairperson), Mayor D Gordon, Councillors A Blackie, S Stewart and J Ward

IN ATTENDANCE

Councillors P Redmond and W Doody
G Cleary (Manager Utilities and Roading), K Simpson (3 Waters Manager), D Lewis (Land Drainage Engineer), E Klopper (Flood Team Lead) and A Smith (Governance Coordinator)

1 APOLOGIES

Moved Councillor Blackie Seconded Councillor Ward

THAT an apology for absence be received and sustained from Councillor Brine.

CARRIED

2 CONFLICTS OF INTEREST

There were no conflicts of interested recorded.

3 CONFIRMATION OF MINUTES

3.1 Minutes of a meeting of the Utilities and Roading Committee held on Tuesday 26 April 2022

Moved Councillor Blackie Seconded Councillor Ward

THAT the Utilities and Roading Committee:

(a) **Confirms** the circulated Minutes of a meeting of the Utilities and Roading Committee held on 26 April 2022, as a true and accurate record.

CARRIED

3.2 Matters arising

There were no matters arising.

4 DEPUTATION/PRESENTATIONS

There were no deputations or presentations.

5 REPORTS

5.1 May 2021, December 2021 & February 2022 Flood Events – Service Requests Update – Emile Klopper (Flood Team Lead), Caroline Fahey (Water Operations Team Leader) and Kalley Simpson (3 Waters Manager)

K Simpson presented this report, providing an update on the status of the flood team work. The weekly updates are also being provided to Councillors to provide regular information. The work being undertaken has included CCTV work, survey work and maintenance work which has meant that the work had progressed quicker than originally expected.

Some of the key areas highlighted were:

Broadway – there was now an identified solution and a request for additional budget for these works would be included as part of the Drainage submission to the Draft Annual Plan. Council staff would be seeking input from landowners regarding the design.

Swindells Road – work was currently underway on a report looking at short, medium and long term solutions. The report would initially go to the Community Board, and there would also be a request for additional budget in the Draft Annual Plan.

Fuller Street, Kaiapoi – there was ongoing CCTV work and survey work being undertaken.

Ranui Mews – Onsite investigation had now been completed at this site which had indicated there was an issue with venting. As a trial, a vent was being installed at one of the units and the test would be repeated to see if this addressed the issue

K Simpson pointed out that there are now 60 projects as a result of the flood events, with some not yet started. These projects had been a focus of the flood team and would all be commenced by the next report. It was also planned to have all the flood team work completed by the end of June and for continued work to implement the solutions to be included as part of business as usual in either 3 Waters or the Project Delivery Unit.

Regarding Swindells Road, Councillor Stewart noted that it had been suggested by members of the Woodend-Sefton Community Board, that it may be appropriate to host another public meeting to update the community on this matter. G Cleary advised that staff have been undertaking some targeted consultation, which was planned to continue and it was agreed that a memo will go to the next meeting of the Community Board providing an update.

Councillor Williams asked if there was contractors ready for the venting work at Ranui Mews. K Simpson advised that the contractor involved in the testing, would provide a price to retro-fit a vent to the toilets. It was confirmed that this project was a priority. There were other undertakings in place at this site as a back-up, should this be necessary in any future weather event.

Moved Mayor Gordon Seconded Councillor Blackie

THAT the Utilities and Roading Committee:

(a) **Receives** report No. 220505070890.

(b) **Notes** that 598 drainage service requests were received related to the significant rainfall events in May 2021, December 2021 and February 2022, which have all been responded to although approximately 138 requests require further maintenance or investigation work.

(c) **Notes** that there are currently 59 drainage assessments identified and this is likely to increase as the service requests are worked through. Progress made since the previous Utilities & Roading Committee meeting is set out in Section 4 and is supported by the weekly update memos.

(d) **Notes** that background information in regards to the recent flooding event can be viewed in report No. 220310034384 entitled: "*February 2022 Flood Event - Update on Service Requests*".

(e) **Notes** that a webpage has been set up on the Council's website to provide updates on the status of drainage works underway and targeted information will be sent out to the Waikuku Beach and Kaiapoi communities.

URL:https://www.waimakariri.govt.nz/services/waterservices/stormwater/drainage-works

(f) **Notes** that if further budgets are required for any capital works identified as part of the drainage assessment work, that these will be sought as part of the 2022/23 Annual Plan process.

(g) **Circulates** this report to the Council and community boards for information.

CARRIED

Mayor Gordon thanked staff for the work being undertaking and the regular updates now being provided to Councillors. It is appreciated that the work undertaken at Ranui Mews was being given priority.

6 CORRESPONDENCE

There was no correspondence.

7 PORTFOLIO UPDATES

7.1 Roading – Councillor Paul Williams

Councillor Williams nothing to add.

Councillor Redmond noted there he had observed a number of small potholes around the District and was there a strategy to address these, taking into account that it is not winter season yet. G Cleary responded that there is work planned for these, noting the extreme wet weather events that the district has endured in the past 12 months. A more detailed briefing will be provided to elected members on how Council deals with maintenance.

7.2 Drainage and Stockwater – Councillor Sandra Stewart

Councillor Stewart's main point referred to the Mill Road stormwater management area consent which had been requested that to be put on hold, because Ecan have advised that their staff recommendation is to decline this application. This was due to the work intercepting with groundwater being considered a take and use of groundwater which is prohibited activity in an over allocated groundwater zone, which this zone is. This is a significant issue across

the region for all Councils, that Ecan is interpreting any work with stormwater management, digging into or touch the groundwater, is considered a take and in conflict with Plan Change 7. G Cleary advised that staff have asked Environment Canterbury that this consent application be put on hold. This is potentially a significant issue with all councils in Canterbury as it means that any activities that a Council carries out that intercepts groundwater, that could result in an inadvertent take, would be a prohibited activity under Plan Change 7. A forum is being brought forward regarding this, and also be taking this issue up directly with Environment Canterbury. In this case, it would mean that the Council could not delivery the capital project for this financial year and this could have an impact on the immediate community and property owners in the vicinity.

7.3 Utilities (Water Supplies and Sewer) – Councillor Paul Williams

Councillors Williams advised of a power outage in Ohoka and the water station has tripped because of this.

Sewerline from Loburn Lea was approximately two thirds completed and progressing well with no major road disruptions.

7.4 Solid Waste– Councillor Robbie Brine

Councillor Brine was not present.

7.5 Transport – Mayor Dan Gordon

Regarding the matter of reducing the speed threshold in Oxford, there had been a direction from the Government which appears to allow greater flexibility on this matter, without it being a significant cost. Mayor Gordon was awaiting to receive confirmation of this in writing.

At a recent meeting of the Regional Transport Committee there was a presentation from Charlotte French from Waka Kotahi on the challenges that Council's have in setting speed limits. Mayor Gordon considered this to be a beneficial presentation and for staff to arrange it to be presented to the Council in the near future.

It is now three years since the safety improvements were promised from Waka Kotahi for Woodend. A meeting is scheduled at which the Mayor is seeking a commitment from Waka Kotahi that these improvements will be provided and a timeline for this.

8 QUESTIONS UNDER STANDING ORDERS

There were no questions under standing orders.

9 URGENT GENERAL BUSINESS

There was no urgent general business.

10 MATTERS TO BE CONSIDERED WITH THE PUBLIC EXCLUDED

Section 48, Local Government Official Information and Meetings Act 1987

Moved Councillor Ward Seconded Councillor Blackie

THAT the public be excluded from the following parts of the proceedings of this meeting.

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Item Nº	Reason for protection of interests	Ref NZS 9202:2003 Appendix A
10.1 – 10.3	Protection of privacy of natural persons To carry out commercial activities without prejudice	A2(a) A2(b)ii

CARRIED

CLOSED MEETING

Resolution to resume in Open Meeting

Moved Mayor Gordon Seconded Councillor Blackie

THAT open meeting resumes and that the resolution(s) made with the public excluded be made public.

CARRIED

OPEN MEETING

NEXT MEETING

The next meeting of the Utilities and Roading Committee is scheduled for 3.30pm, on Tuesday 21 June 2022.

There being no further business, the meeting closed at 3.58pm.

CONFIRMED

_____
Chairperson
Councilor R Brine

_____
Date

BRIEFING

At the conclusion of the meeting Kalley Simpson (3 Waters Manager), D Lewis and C Fahey provided an overview on 3 Waters staff's management of drainage maintenance within the Waimakariri district. A summary of the current status of maintenance work was also presented.

WAIMAKARIRI DISTRICT COUNCIL

REPORT FOR INFORMATION

FILE NO and TRIM NO:	DRA-16-03 / 220609098129
REPORT TO:	UTILITIES AND ROADING
DATE OF MEETING:	21 June 2022
AUTHOR(S):	Emile Klopper, Flood Team Lead Caroline Fahey, Water Operations Team Leader Kalley Simpson, 3 Waters Manager
SUBJECT:	May 2021, December 2021 & February 2022 Flood Events – Service Requests Update
ENDORSED BY: (for Reports to Council, Committees or Boards)	Department Manager / pp Chief Executive

1. SUMMARY

1.1 The purpose of this report is to update the Utilities & Roading Committee on the status of the drainage service requests received related to the significant rainfall events that occurred over the 29th to 31st May 2021, 15th December 2021 and 12th February 2022.

1.2 A total of 598 drainage service requests were received related to these rainfall events and total of 61 areas have been identified for further assessment.

1.3 The focus of this report is to provide feedback on the 61 areas identified and progress made on their investigation since the previous Utilities and Roading Committee meeting held on 17 May 2022.

Attachments

i. Progress and status of the 61 Focus Areas

2. RECOMMENDATION

THAT the Utilities & Roading Committee:

(a) **Receives** report No. 220609098129.

(b) **Notes** that 598 drainage service requests were received related to the significant rainfall events in May 2021, December 2021 and February 2022, which have all been responded to although approximately 138 requests require further maintenance or investigation work.

(c) **Notes** that there are currently 61 drainage assessments identified and this is likely to increase as the service requests are worked through. Progress made since the previous Utilities & Roading Committee meeting is set out in Section 4 and is supported by the weekly update memos.

(d) **Notes** that background information in regards to the recent flooding event can be viewed in report No. 220310034384 entitled: "*February 2022 Flood Event - Update on Service Requests*".

(e) **Notes** that a webpage has been set up on the Council's website to provide updates on the status of drainage works underway and targeted information will be sent out to the Waikuku Beach and Kaiapoi communities.

URL:https://www.waimakariri.govt.nz/services/water-services/stormwater/drainage-works

(f) **Notes** that additional budgets for the Swindells Road Drainage Upgrade and Broadway Ave Drainage Upgrade projects in Waikuku Beach and High Street Drainage Upgrade project in Oxford have been approved for inclusion in the 2022/23 Annual Plan.

(g) **Circulates** this report to the Council and community boards for information.

3. PROGRESS SINCE PREVIOUS REPORT

3.1. Attachment I provides a snapshot of each of the 61 Focus Areas' status and whether CCTV, Maintenance and/or Survey is required.

3.2. In addition to Attachment I, three separate projects were compiled to consolidate the remaining focus areas' works into separate packages of maintenance, CCTV and survey works.

3.3. Since the previous U&R Committee update meeting, the Flood Team have continued to focus their attention on investigating the below 5 key focus areas, with the addition of the aforementioned "consolidation projects". These key Focus Areas and their progress will be briefly discussed in Section 4 of this report.

- Broadway Avenue, Waikuku Beach
- Swindells Road, Waikuku Beach
- Fuller Street, Kaiapoi
- Cust Road, Cust
- Ranui Mews, Kaiapoi
- Consolidation Projects
  - Maintenance
  - CCTV & Jetting
  - Surveying

3.4. **Table 1** below provides a breakdown/summary of all the focus areas per drainage scheme.

Table 1: 61 Focus Areas Breakdown

Scheme	Total	Status			Planned		
		Allocated	Started	Complete / BAU	Maintenance	CCTV & Jet	Survey
Rangiora	3	3	3	0	0	1	0
Kaiapoi	17	17	15	1	2	7	0
Woodend	3	3	3	0	0	1	0
Waikuku Beach	4	4	3	1	1	1	0
Pines Kairaki	3	3	2	0	1	0	0
Pegasus	1	1	1	0	0	1	0
Oxford Urban	7	7	3	3	2	1	0

Ohoka Rural	4	4	3	0	0	0	0
Oxford Rural	1	1	1	0	0	0	0
Coastal Rural	4	4	2	1	0	0	0
Rural Central	1	1	1	0	0	0	0
Cust Rural	2	2	2	0	1	0	0
District Drainage	9	9	5	1	0	0	0
Other	2	2	1	1	0	0	0
Total	**61**	**61**	**45**	**8**	**7**	**12**	**0**

3.5. Of the 61 areas identified for further investigation 8 are complete, 45 are underway and the remaining areas have maintenance and/or CCTV and jetting works planned.

4. KEY FOCUS AREAS

4.1. Progress on the 5 key focus areas is summarised below as well as the "Consolidation Projects" (Maintenance, CCTV and Survey packages):

4.1.1. Broadway Avenue, Waikuku Beach

- The Flood Team have progressed the 31 Broadway Avenue project to a point that the 3 Waters team can take it over to manage, procure and construct as part of their ongoing business as usual projects.
- The final design includes a proposed piped primary system with a new proposed scruffy dome inlet in the Kiwi Ave Reserve. The piped primary system flows from the reserve via the shared driveway of 33A and 33B Broadway Ave to the nearby drain via a new proposed pipe alignment. The new alignment will enable sufficient drainage within the reserve for the nuisance events. As part of the proposed design, a formalised overland flowpath will be constructed following the same flow route as the primary network.
- An onsite meeting was held between the Flood Team, 3 Waters team and some of the affected property owners to discuss the project's drivers and timelines. Consultation with the affected property owners is still underway.
- An additional budget of $120,000 in 2022/23 for these works has been approved as part of Drainage Staff Submission to 2022/23 Annual Plan.

4.1.2. Swindells Road, Waikuku Beach

- The driveway culverts and swales along both sides of Swindells Road are partially silted up and is programmed to be cleaned out by CORDE.
- Optioneering workshop was held to discuss potential solutions.
- Options memo is currently being progressed covering the following potential options:
    - Localised upgrades of driveway culverts, pipes and swale to provide a functional improvement to the existing system (expected 2 year capacity).
    - System wide upgrades and extension to provide a 5 year level of service capacity in the primary system.
    - Provision of pump chamber to enable efficient and effective deployment of a temporary pump.
    - Installation of a permanent pump station.
    - Use of the adjacent reserve to provide a stormwater retention basin.
- An additional budget of $450,000, comprising of $50,000 in 2022/23 for design and $400,000 in 2023/24 for construction, has been approved as part of Drainage Staff Submission to 2022/23 Annual Plan.

- This budget will enable the system to be upgrade and extended along the toe of the stopbank, and also for a pump chamber to be installed for a temporary pump. The next steps are to finalise the options memo before seeking feedback on the proposed solution.

4.1.3. Fuller Street, Kaiapoi

- Topographical survey was done by PDU and survey results were sent through to the Flood Team for assessment.
- Onsite CCTV connectivity surveys were requested from Clyne and Bennie and completed. Results to be sent through shortly.
- Potential solution is a bund/barrier along the rear boundary and flapgates on the stormwater outlets to prevent water from the drain entering the property and onsite improvements to drain rainwater from the property to the drain.
- A memo will be prepared with advice to the landowners in terms of onsite improvements and concept design and cost estimate for the bund/barrier along the rear boundary once CCTV connectivity results have been obtained.
- The works to implement the proposed solution will be undertaken from the existing Kaiapoi Minor Stormwater Improvements budget in 2022/23.

4.1.4. Cust Road, Cust

- Desktop and onsite investigations were carried out to determine the extent of the problems and their root cause.
- Various options were developed as part of the preliminary design, all of which require some level of input from the Roading team. Meetings have been held to discuss the options with the team.
    - As part of the options analysis it was recommended to utilise new machinery and equipment recently purchased by the Roading Maintenance Contractor that will enable the team to easily install soak pits up to 6m deep. It was recommended that these soak pits should be installed on a trial basis to determine their efficiency.
- Flood Team compiled a pros and cons list of the various options complete with high level cost estimate to assist the Roading Team in the selection of a most appropriate option.
- Maintenance tasks have been scoped up and programmed to be undertaken by the maintenance Contractors within the stock race.
- The abovementioned maintenance tasks include:
    - Cleaning and removing overgrown vegetation within the stockwater race from 1689 Cust Road through to and including the crossing under Earlys Road.
    - Jetting and cleaning the relevant culverts within the above route.

4.1.1. Ranui Mews, Kaiapoi

- The venting investigation work undertaken in May has confirmed that the onsite sewer system is prone to experiencing venting issues even if the public system has minor surcharging.
- It has therefore been decided to progress with installing a vent on Unit 20 and then undertaking the venting test again to confirm the issue is resolved for this unit. If successful additional venting will be installed on the other units.
- Loggers have been installed in a manhole at Ranui Mews and also in a manhole in Ohoka Road. The loggers will provide valuable information on any remaining issues with the public sewer system.
- The loggers have been programmed to send out email/text alerts if the manhole surcharges. This will give an early warning that there may be an issue with the sewer system for staff to respond to. If necessary sucker trucks will be deployed to the Ohoka Road area and the Property team have portable toilets that can be supplied for use within the bathrooms.

- It is intended that the loggers will remain in place for a period of time to confirm that the maintenance works on the public system (to remove the fat build up) and works on the onsite sewer system to improve the venting has resolved the issue.

4.2. Further programme and progress updates will be reported to the Utilities and Roading Committee at future meetings as this work progresses.

Implications for Community Wellbeing

Some of the locations of flooding have had flooding in the past and some residents have had to make insurance claims for flood related damage. This has a potential implication on community wellbeing for these residents.

4.3. The Management Team has reviewed this report and support the recommendations.

5. COMMUNITY VIEWS

5.1. Mana whenua

Te Ngāi Tūāhuriri hapū are not likely to be directly affected by this work. However they will have an interest in any future proposed works that may have an impact on waterways and rivers. Staff will update the Runanga at the executive meetings and where relevant on specific projects engage with MKT.

5.2. Groups and Organisations

Directly affected property owners will be consulted with on the proposed upgrades.

Community boards and drainage advisory groups will be updated on the investigation works and any specific future proposed works that come out of the assessment.

5.3. Wider Community

The wider community will be kept informed via the Council's website. A dedicated webpage has been set up for the recent flood events across the wider district, refer:

https://www.waimakariri.govt.nz/services/water-services/stormwater/drainage-works

A community meeting was held for Waikuku Beach residents on 6 July 2021, however not all investigation work has been completed in this area. If necessary, a targeted update to the Waikuku Beach community, either via a local newsletter flyer or dedicated flyer will be delivered to all addresses in the village.

Target consultation has been undertaken for the Kaiapoi Community via the Shovel Ready programme of works which will address most of the issues experienced in the Dudley Drain, Feldwick Drain and McIntosh Drain catchments.

6. OTHER IMPLICATIONS AND RISK MANAGEMENT

6.1. Financial Implications

The costs associated with this investigation work will be charged to existing Drainage asset management and operations budgets. Any physical inspection work such as pipe maintenance and CCTV inspection work will be charged to the maintenance budget for the relevant Drainage scheme.

The following budgets were recently approved by Council for inclusion in the final 2022-23 Annual Plan (refer TRIM 220505071056):

- Broadway Ave Drainage Upgrade – $120,000 (in 2022/23).
- Swindells Road Drainage Upgrade – $450,000 (comprising of $50,000 in 2022/23 for design and $400,000 in 2023/24 for construction).
- High Street Drainage Upgrade - $200,000 (in 2022/23).

All other investigation and maintenance works is being undertaken from existing operational budgets.

6.2. **Sustainability and Climate Change Impacts**

The recommendations in this report do not have sustainability and/or climate change impacts.

Any proposed upgrading works will consider the potential impacts of climate change in terms of higher rainfall intensities and sea level rise. The procurement of any physical works will use sustainable procurement practices.

6.3 **Risk Management**

There are no additional risks arising from the adoption/implementation of the recommendations in this report. The improvements implemented as a result of the drainage assessment identified will reduce the overall risk profile to Council and the community.

Health and Safety

The health and safety risks associated with undertaking this investigation work will be managed by standard Council processes.

7. CONTEXT

7.1. **Consistency with Policy**

This matter is not a matter of significance in terms of the Council's Significance and Engagement Policy.

7.2. **Authorising Legislation**

The Local Government Act 2002 sets out the power and responsibility of local authorities, including the Council's role in providing drainage services.

7.3. **Consistency with Community Outcomes**

The Council's community outcomes listed below are relevant to the actions arising from recommendations in this report.

- *There is a safe environment for all*
- *Core utility services are provided in a timely and sustainable manner*

7.4. **Authorising Delegations**

The Utilities and Roading Committee is responsible for activities related to stormwater drainage.

Appendix I – Progress and status of the 61 Focus Areas

Scheme	Location	Allocated	Progress	Maintenance	CCTV & Jet	Survey
Rangiora	Newnham Street	Flood Team - Consolidation Projects	Underway		Planned	
	Ivory Street	Roading	Underway			
	Strachan Place	3 Waters	Underway	Planned	Complete	
Kaiapoi	310 Beach Road	3 Waters	Underway	Complete	Planned	TBD
	34 Mansfield Drive	Flood Team - Consolidation Projects	Underway		Planned	
	364B Williams Street	Roading	Underway	Planned		
	44 Bracebridge Street	Flood Team - Consolidation Projects	Underway		Planned	
	46 A Fuller Street	Flood Team	Underway	Complete	Complete	Complete
	52 Feldwick Drive	Roading	Underway			
	59 Main North Road	3 Waters	Underway	Complete		
	68 Sovereign Boulevard	3 Waters	Underway	Planned		
	69 Old North Road	3 Waters	Underway			
	Dale Street	Roading	Underway		Planned	
	1 Wesley Street	Flood Team - Consolidation Projects	Underway		Planned	
	Porter Place	3 Waters	Complete/BAU	Complete		
	14 Kalmia Place	Flood Team - Consolidation Projects	Underway		Planned	
	15 Cridland Street West	Flood Team	Underway			TBD
	169 Williams Street	Flood Team - Consolidation Projects	Underway		Planned	
	26 Hamel Lane	3 Waters	Not yet started			
	30 Williams Street	Roading	Underway			

Woodend	39 Woodglen Drive	Flood Team - Consolidation Projects	Underway		Planned	
	5 B Norton Place	PDU	Underway		Complete	Complete
	189 Rangiora Woodend Road	Roading	Underway			
Waikuku Beach	31 Broadway Avenue	Flood Team	Complete/BAU	Complete	Complete	Complete
	12 Reserve Road	Flood Team	Underway	Planned	Complete	Complete
	14 Kiwi Avenue	Flood Team	Underway	Planned	Complete	Complete
	4 Swindells Road	PDU	Underway	Planned	Planned	Complete
Pines Kairaki	Beach Road	PDU	Underway			
	Batten Grove	Flood Team - Consolidation Projects	Underway	Planned		TBD
	56 Featherstone Avenue	3 Waters	Not yet started			
Pegasus	31 Pegasus Main Street	Flood Team - Consolidation Projects	Underway		Planned	
Oxford Urban	12 - 16 Kowhai Street	Flood Team - Consolidation Projects	Underway	Planned	Planned	
	6 Weka Street	PDU	Underway		Complete	
	Bay Road	3 Waters	Underway	Complete		
	13 Queen Street	3 Waters	Complete/BAU	Complete		
	23 Burnett Street	PDU	Not yet started	Planned		TBD
	189 High Street	PDU	Complete/BAU			
	Pearson Drain	3 Waters	Underway			
Ohoka Rural	494 Mill Road	3 Waters	Underway		Complete	
	175 Mill Road	3 Waters	Underway			
	181 McHughs Road	PDU	Underway			
	Wilson Drive	3 Waters	Not yet started			
Oxford Rural	31 Victoria Street	3 Waters	Underway			
Coastal Rural	SH1	Roading	Not yet started			TBD
	4 MacDonalds Lane	Flood Team	Underway			
	11 Stalkers Road	Flood Team	Underway			
	820 Main North Road	3 Waters	Complete/BAU			
Rural Central	Skewbridge	Roading	Underway			

Cust Rural	1649 Cust Road	Flood Team	Underway	Planned		
	1689 Cust Road	Flood Team	Underway	Planned		
	1838, 1840 & 1842 Cust Road	Flood Team	Underway	Planned		
District Drainage	105 Taaffes Glen Road	PDU	Complete/BAU			
	231/217 Toppings Road	3 Waters	Underway			
	51 Smarts Road	PDU	Underway			
	556 Steffens Road	Roading	Not yet started			
	730 Depot Road	Roading	Not yet started			
	951 Upper Sefton Road	Roading	Not yet started			
	Dixons Road	Roading	Underway			
	Hodgsons Road	Roading	Underway			
	Mt Thomas Road	3 Waters	Underway			
Other	Ranui Mews	3 Waters	Underway		Complete	
	Kairaki PS	3 Waters	Complete/BAU		Complete	

WAIMAKARIRI DISTRICT COUNCIL

REPORT FOR INFORMATION

FILE NO and TRIM NO:	SEW-03-01-04-13.01 / 220420060318
REPORT TO:	UTILITIES AND ROADING COMMITTEE
DATE OF MEETING:	21 June 2022
AUTHOR(S):	Sophie Allen – Water Environment Advisor Kalley Simpson – 3 Waters Manager
SUBJECT:	Avian Botulism Management 2021-22
ENDORSED BY: (for Reports to Council, Committees or Boards)	Department Manager / pp Chief Executive

1. SUMMARY

1.1 This report summarises the occurrence, costs and management of avian botulism during the 2021-22 season at the Waimakariri District Council Wastewater Treatment Plants (WWTP).

1.2 This report outlines Version 2 of the WDC Avian Botulism Management Plan; a document that collates current management practices and adds in changes from an SPCA review.

1.3 This report discusses options for management such as water level management within ponds, and discusses a Christchurch City Council outbreak this past summer in relation to potential effects on the Waimakariri District in future.

Attachments:

i. WDC Avian Botulism Management Plan (Version 2): TRIM 201103147380

2. RECOMMENDATION

THAT the Utilities and Roading Committee:

(a) **Receives** report No. 220420060318.

(b) **Notes** the low bird death numbers (48 birds) for the 2021-22 season at coastal Waimakariri District Council wastewater treatment plants (WWTPs), as collected by contractors to check for and contain any avian botulism, with no avian botulism outbreak detected.

(c) **Notes** the production of an updated WDC Avian Botulism Management Plan Version 2, which outlines current management practices, and adds changes from an SPCA review.

(d) **Notes** that Christchurch City Council responded to an avian botulism outbreak at the Bromley Wastewater Treatment Plant in the summer of 2021-22.

(e) **Circulates** this report to the Council, the Waimakariri Water Zone Committee, and the Community Boards for information.

3. BACKGROUND

3.1 An update on avian botulism and its management was presented to Council on 24 September 2019, (190905124322[v2]), 21 August 2018 (180719080426) and December 2015 (160301016953). These reports detailed the identification and management response of the disease at the Kaiapoi, Woodend, Rangiora and Waikuku WWTPs, and surrounding waterbodies.

3.2 Avian botulism is a paralytic disease of waterfowl, caused when toxin is released by bacteria commonly found in the substrates of lake and pond beds, including wastewater oxidation ponds. This toxin accumulates in aquatic invertebrates, which are then consumed by birds. The bacterium *Clostridium botulinum* is widespread in soil and requires warm temperatures, a protein source and an anaerobic (i.e. no oxygen) environment in order to become active and produce toxin. Decomposing vegetation and invertebrates combined with warm temperatures can provide ideal conditions for the botulism bacteria to activate and produce toxin.

3.3 Botulism is an intoxication (i.e. food poisoning) rather than an infectious disease. The affected birds show a number of consistent symptoms including weakness, lethargy and a progressive paralysis, which initially affects the legs and neck. Walking becomes difficult and paralysis of the neck means birds cannot hold their heads erect. For birds sitting on the water this inevitably leads to death by drowning.

3.4 Carcasses of dead birds are subsequently fed on by flies and their larvae, which then concentrates the botulinum toxin within the larvae and the bird-toxic maggot cycle commences. This leads to the deaths of subsequent waves of birds as they feed on the maggots in, and around, the dead bird carcasses.

3.5 Providing mildly affected birds with fresh water, shade and protection from predators may help them recover from the intoxication. Avian botulism antitoxin is available (potentially only overseas, such as in the USA), but requires special handling and must be given early in the intoxication. Birds that survive a botulism outbreak are not immune to future exposure to botulism toxin.

3.6 Avian botulism Type C, as identified at the Kaiapoi Wastewater Treatment plant, is not thought to be a risk to human health. Avian botulism Type E, which has not been identified in the Waimakariri District, does affect humans in rare cases.

4. ISSUES AND OPTIONS

Overview of avian botulism 2013-22

4.1. Figure 1 shows bird carcass numbers that have been collected by contractors at WWTPs and sometimes other ponds managed by WDC from 2013-22. In 2021-22 48 birds in total were collected from four WWTPs, primarily mallards and paradise shelducks, but also species such as cormorants (shags), Canada geese, New Zealand scaup, black-backed gull and black swans also collected. Note that cause of death is not confirmed by autopsy. However, avian botulism is thought to have caused significant number of deaths in Waimakariri District (i.e. defined as an outbreak) in 2013/14, 2014/15, 2017/18 and 2018/19.

4.2. The species of each carcass collected is recorded by Keystone Ecology Ltd, who are experienced in bird identification. No species that are listed as rare or threatened by the Department of Conservation threat classification system were collected in 2021/22 or in previous year since species records have been made.

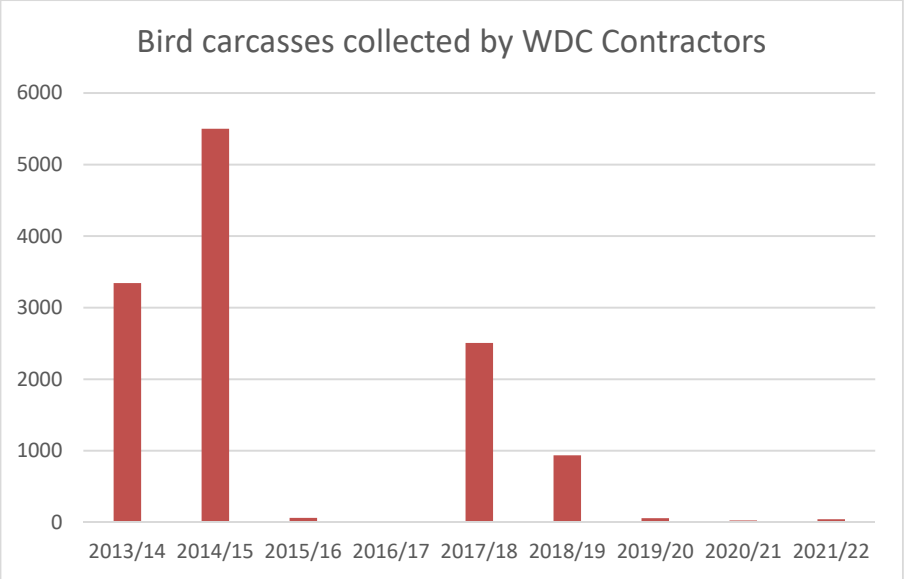

Figure 1: Bird carcasses collected 2013-22 by WDC contractors at all sites. NB data value may be slightly incorrect for the 2015-16 year, due to varying reports.

4.3. The first noted outbreak in the Waimakariri District was at the Kaiapoi Wastewater Treatment Plant (WWTP) in the summer of 2013/14. In total there were 3,336 birds that died at the Kaiapoi WWTP and 7 at Woodend WWTP. The majority of the dead birds were paradise shelducks and mallards. The second outbreak in the summer of 2014/15 was more significant with a total of 5,499 dead birds over the summer period. The incidence of avian botulism was also more widespread with birds affected at the Kaiapoi, Woodend, Rangiora and Waikuku Beach treatment plants, at the Kaiapoi Lakes public area, the Pegasus wetlands and the Tūhaitara Coastal Park wetlands (Tutaepatu Lagoon). In 2017/18 there were an estimated 2505 bird carcasses collected by Council contractors. Any outbreaks in the summers of 2015/16, 2016/17, 2019/20, 2020/21 and 2021/22 were negligible, due to likely factors such as weather (temperature and wind direction for example) that have not be analysed (see Figure 1).

SPCA Review of the WDC Avian Botulism Management Plan

4.4. An offer from the SPCA to review the WDC Avian Botulism Management Plan was accepted. The SPCA submitted their review report in October 2020. Most recommendations where accepted, and used to update the WDC Avian Botulism Management Plan (i.e. Version 2 – see Attachment 1).

4.5. The SPCA recommended improved monitoring and management of sick and dying birds. Due to the technical and health and safety difficulties of capturing sick and dying birds for rehabilitation or euthanasia, WDC did not incorporate the SPCA recommendation to capture and rehabilitate or euthanise sick and dying birds, unless they are a rare or threatened species listed by the Department of Conservation Threat Classification System. The WDC management plan focuses primarily on the prevention of spread of the disease to other birds.

Avian Botulism outbreak at Bromley Wastewater Treatment Plant

4.6. Over the summer of 2021-22, Christchurch City Council has confirmed that approximately 1350 dead waterfowl were collected from Bromley Wastewater Treatment Plant wetlands in response to an avian botulism outbreak. Due to difficultly of accessing islands in the wetlands, some bird carcasses were not able to be collected, therefore the total number of deceased birds, primarily thought to have died from avian botulism causes is in excess of 1,500.

4.7. Since the summer of 2011/12, there have sometimes been avian botulism Type C outbreaks in the Bromley Wastewater ponds in Christchurch. In summer 2012 there was a large outbreak with 6,300 birds collected, with death attributed to avian botulism within the Bromley Oxidation ponds. The actual estimated number of bird deaths was over 7,000 due to a number unable to be recovered.

4.8. In 2013/14, two years after the Bromley WWTP outbreak, WDC experienced the first noted avian botulism outbreak for the District at Kaiapoi WWTP. It was speculated that the avian botulism outbreak at the Kaiapoi WWTP was related to the outbreak at Bromley spreading to the wider area, such as through the movement of sick waterfowl between the two locations.

4.9. The bacterium that causes avian botulism is naturally occurring and is likely always present at all WWTP wetland sites at low levels in sediments, so is not necessarily a new infection that is spread between sites. It is rather that an outbreak at one site, such as Bromley WWTP, leads to concentrated toxins being passed on via the 'carcass-maggot cycle'. This cycle is where birds eat the maggots of a carcass that has passed away from avian botulism, where the toxin has accumulated then moves to another site before dying and also producing maggots with the accumulated toxin.

Water level management in WWTP wetland ponds

4.10. Water levels are able to be raised during summer time in WWTP wetlands with the use of weirs. In January 2022 the Kaiapoi infiltration wetlands water level was raised to cover cyanobacterial mats that had accumulated on the western shore and were decomposing exposed to the air, causing odour issues.

4.11. The maintenance of high water levels or slow raising of water levels is also recommended in the WDC Avian Botulism Management Plan, therefore odour management and avian botulism management options are compatible. However is should be noted that a slow increase in the water levels is recommended for avian botulism management, to not create a mass die-off event of food for waterfowl, which anecdotally is thought that could trigger an avian botulism outbreak. The water level in the Kaiapoi infiltration wetlands was gradually raised over a period of about a week, which was not found to cause any issues for avian botulism.

Implications for Community Wellbeing

There are not implications on community wellbeing by the issues and options that are the subject matter of this report. An information pamphlet on Avian Botulism has previously been prepared (refer TRIM 190204012544) to address the community's concerns regarding the disease.

4.12. The Management Team has reviewed this report and support the recommendations.

5. COMMUNITY VIEWS

5.1. Mana whenua

Te Ngāi Tūāhuriri hapū are likely to be affected by, or have an interest in the subject matter of this report, as some waterfowl are taonga species, collected for mahinga kai.

5.2. Groups and Organisations

There are groups and organisations likely to be affected by, or to have an interest in the subject matter of this report such as Te Kōhaka o Tūhaitara Trust, North Canterbury Fish and Game, the SPCA, Community and Public Health, Department of Conservation, Templeton Group and Christchurch City Council. Email updates have been sent out to a list of key stakeholders during the summer of 2021-22.

5.3. Wider Community

5.3.1. Although there is no legislative requirement, there is a social expectation of the Council to prevent outbreaks spreading to other wetland and lake areas, such as

in the Selwyn District and Hurunui District (e.g. Lake Forsyth/Wairewa, Te Waihora/ Lake Ellesmere).

5.3.2. Gamebird hunters i.e. duck shooters may have reduced opportunities for hunting, and require clear communication on the severity and locations of outbreaks.

5.3.3. Bird-watchers, bird lovers and the general public could be saddened to see sick and dead birds at public locations. Rare or threatened birds could be affected, though no rare or threatened bird deaths have been recorded to date.

5.3.4. Opportunities for mahinga kai (customary food gathering) of waterfowl and tuna (eel) may be reduced. Clear communication is needed with appointed Tangata Tiaki (customary fisheries officers).

5.3.5. The wider community is not likely to be affected by, or to have an interest in the subject matter of this report.

6. OTHER IMPLICATIONS AND RISK MANAGEMENT

6.1. Financial Implications

6.1.1. There are no financial implications of the decisions sought by this report. This report is for information only.

6.1.2. This budget is an existing budget included in the Annual Plan for the operational cost of the wastewater treatment plants.

6.1.3. The cost of avian botulism management for 2021-22 was $19,525 excl GST, however this amount also includes a minimal cost of midge emergence trap monitoring, which is carried out by the contractor Keystone Ecology in the same visit. The cost in 2018-19 was $45,829 excl. GST. The cost in 2017-18 was $41,980 excl. GST for the bird collection by an ecology contractor. The variation is cost per year relates generally to an increase number of visits and/or hours required to retrieve bird carcasses.

6.1.4. The cost for bin rental, collection and disposal in 2021-22 was $1,070 (up to 30 April 2022) excl GST. The cost in 2018-19 for the waste disposal contractor was $3,081 excl. GST, and $5,773 excl. GST for 2017-18.

6.1.5. Costs to-date have come from within WDC Wastewater budgets, including for areas such as stormwater ponds and reserve areas. This may need to be re-evaluated if significant costs arise from outside of WWTP areas.

6.1.6. The cost of management is thought to be reduced by efficient monitoring, quick response and a coordinated response with other parties, such as the Christchurch City Council.

6.2. Sustainability and Climate Change Impacts

6.2.1. The recommendations in this report do not have sustainability and/or climate change impacts. However, climate change will have a likely effect on avian botulism outbreaks in the future if there are warmer temperatures for longer durations for example.

6.2.2. WDC staff monitor for weather predictions of warmer winters and summers, to enact management options early, and reduce risk of a larger or widely-dispersed outbreak.

6.3 Risk Management

6.2.3. There are no risks directly arising from the adoption/implementation of the recommendations in this report.

6.3 **Health and Safety**

6.2.4. There are no specific health and safety risks directly arising from the adoption/implementation of the recommendations in this report.

6.2.5. Health and Safety documentation and practices such as a Site Specific Safety Plan will continue to be in place and reviewed when appropriate for WDC staff and contractors.

6.2.6. Risks to human health can be minimised by clear communication of risks to staff i.e. promoting the use of gloves when in contact with bird carcasses and implementation of contractors' Health and Safety Plans.

6.2.7. In 2014/15 eels in Tutaepatu Lagoon are thought to have consumed some of the carcasses, which led to over 20 observed eels deaths. This raises a potential health and safety issue, due to the fact eels are gathered as a food source.

6.2.8. Collection of bird carcasses from wetlands is restricted to retrieval of wind-blown birds from the water's edge due to the risk for humans to enter the wetlands with treated effluent. This can reduce the efficiency and timeliness of bird carcass collection, with some areas are unable to be safely accessed for carcass removal.

6.2.9. Outbreaks should be re-confirmed to be avian botulism Type C by the Ministry of Primary Industries at regular intervals, particularly if symptoms presented are atypical.

7. CONTEXT

7.1. **Consistency with Policy**

7.1.1. This matter is not a matter of significance in terms of the Council's Significance and Engagement Policy.

7.2. **Authorising Legislation**

7.2.1. The Local Government Act 2002 sets out the power and responsibility of local authorities, including the Council's role in providing wastewater services.

7.3. **Consistency with Community Outcomes**

7.3.1. The Council's community outcomes are relevant to the actions arising from recommendations in this report.

- There is a healthy and sustainable environment for all

7.4. **Authorising Delegations**

7.4.1. This report is for information only. No delegations apply.

Avian Botulism Management Plan 2020

Prepared by Sophie Allen – Water Environment Advisor
Waimakariri District Council
Version 2.0 (21 October 2020)

TRIM 201103147380

Prepared for: 3 Waters, Waimakariri District Council

Prepared by: Sophie Allen – Water Environment Advisor

File / Record Number: SEW-03-01-04-13.01 / 201103147380

Version Number	Prepared By	Comments	Date
1.0	Sophie Allen	First version	30 October 2019
1.1	Sophie Allen	Living document – to be continually reviewed and updated	19 February 2019
1.2	Sophie Allen	Reviewed by Kalley Simpson – 3 Waters Manager	18 March 2019
1.3	Sophie Allen	Feedback from MTO meeting 16 September 2019	17 September 2019
2.0	Sophie Allen	Incorporating selected recommendations from the SPCA review	21 October 2020

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TRIM 201103147380

1. Objectives

The objectives of this management plan are to:

- Minimise bird deaths from avian botulism, particularly of rare or threatened species within the Waimakariri District.
- Minimise spread of an avian botulism outbreak to other areas within the District and Canterbury region.
- Minimise any real or perceived health risk from avian botulism to our community, and minimise further bird deaths.

2. Background

2.1. The Disease

Avian botulism is a paralytic disease of waterfowl, caused when toxin is released by bacteria commonly found in the substrates of lake and pond beds, including wastewater oxidation ponds and wetlands. This toxin accumulates in aquatic invertebrates, which are then consumed by birds. The bacterium Clostridium botulinum is widespread in soil and requires warm temperatures, a protein source and an anaerobic (i.e. no oxygen) environment in order to become active and produce toxin. Decomposing vegetation and invertebrates combined with warm temperatures can provide ideal conditions for the botulism bacteria to activate and produce toxin.

Botulism is an intoxication (i.e. food poisoning) rather than an infectious disease. The affected birds show a number of consistent symptoms including weakness, lethargy and a progressive paralysis, which initially affects the legs and neck. Walking becomes difficult and paralysis of the neck means birds cannot hold their heads erect. For birds sitting on the water this inevitably leads to death by drowning.

3. Introduction

3.1. Summary of Avian Botulism Outbreaks

3.1.1. Wider Canterbury

Since the summer of 2011/12, there have been avian botulism Type C outbreaks in the Bromley Wastewater ponds in Christchurch. In summer 2012 there were 6,300 birds collected, with death attributed to avian botulism within the Bromley Oxidation ponds. The actual estimated number of bird deaths is over 7,000 due to a number unable to be recovered. Since then there have been outbreaks at the Christchurch City Council ponds every summer. The general noted pattern is that there is a reduction in dead birds after approximately 3 to 4 years.

3.1.2. Waimakariri District

The first outbreak in the Waimakariri District was at the Kaiapoi Wastewater Treatment Plant (WWTP) in the summer of 2013/14. In total there were approximately 3,336 birds that died at the Kaiapoi WWTP and 7 at Woodend WWTP. The majority of the dead birds were paradise shelducks and mallards. The second outbreak in the summer of 2014/15 was more significant with a total of 5,499 dead birds over the summer period. The

spread of avian botulism was also more widespread with birds affected at the Kaiapoi, Woodend, Rangiora and Waikuku Beach treatment plants, at the Kaiapoi Lakes public area, the Pegasus wetlands and the Tūhaitara Coastal Park wetlands (Tutaepatu Lagoon). The outbreaks in the summers of 2015/16 and 2016/17 and 2019/20 were negligible (see Figure 1). This was potentially due to seasonal factors, such as rainfall and temperature, with no direct factors such as WDC management confirmed.

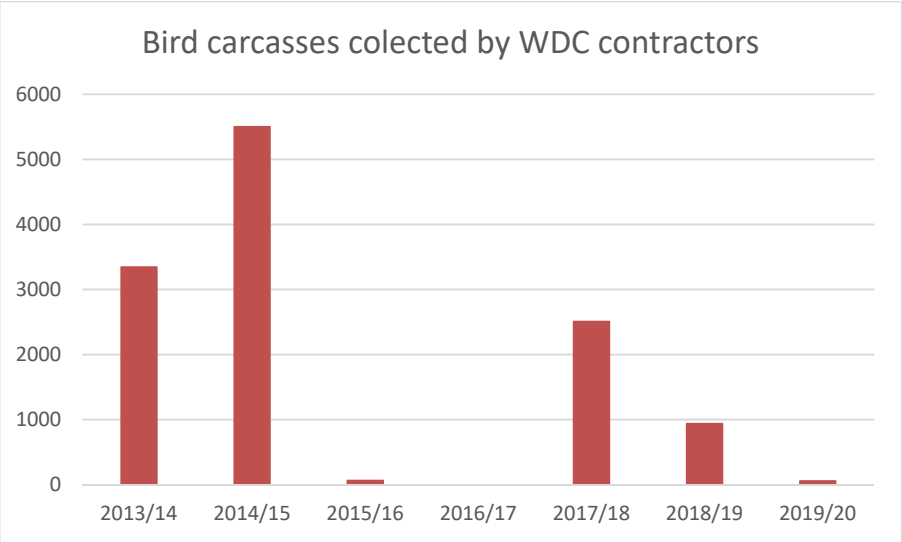

Figure 1: Bird carcasses collected 2013-20 by WDC contractors at all sites. NB data value may be incorrect for the 2015-16 year, due to varying reports.

3.2. Rare or threatened bird species

No rare or threatened bird species (as defined by the Department of Conservation Threat Classification System) have been found during bird carcass collection by Keystone Ecology Ltd, who are experienced in bird identification.

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3.3. **Avian botulism toxic cycle**

Birds initially consume invertebrates that contain the naturally-occurring botulism toxin. Carcasses of dead birds are subsequently fed on by flies and their larvae, which then concentrates the botulinum toxin within the larvae and the carcass-toxic maggot cycle commences (see Figure 2). This leads to the deaths of subsequent waves of birds as they feed on the maggots in, and around, the dead bird carcasses.

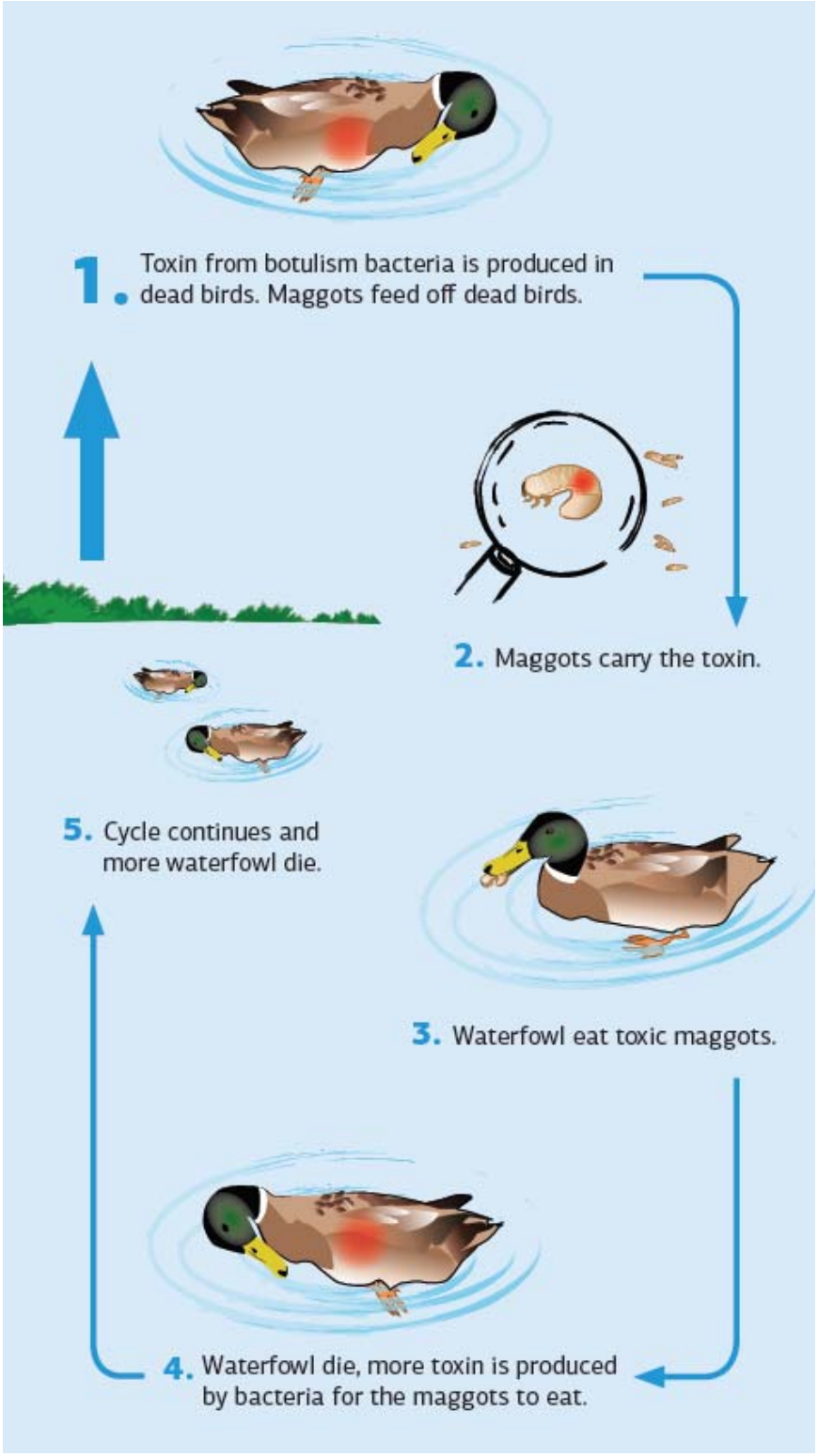

Figure 2: The 'carcass - maggot cycle', which perpetuates avian botulism.

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3.4. Treatment

Providing mildly affected birds with fresh water, shade and protection from predators may help them recover from the intoxication. Avian botulism antitoxin is available (potentially only overseas, such as in the USA), but requires special handling and must be given early in the intoxication. Birds that survive a botulism outbreak are not immune to future exposure to botulism toxin.

3.5. Risk to other species

Avian botulism Type C, as identified at the Kaiapoi Wastewater Treatment plant, is not a risk to human health. Avian botulism Type E, which has not been identified in the Waimakariri District, does affect humans in rare cases.

Fish, such as eels in Tutaepatu Lagoon in the Tuhaitara Coastal Park, have anecdotally died due to consuming birds containing the toxins. Dogs have also been anecdotally reported to have been affected overseas, though not within the Waimakariri District.

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4. Management options

Documented management options of avian botulism include bird carcass removal, bird deterrents (such as canons), barley straw bale installation, maintenance of water levels, and avoiding removal of macrophytes (water plants). Other management options may arise from further research and trials, therefore WDC should keep up-to-date with developments.

Management follows a seasonal pattern with an example of a typical year in Table 1.

Table 1: Overview example of the seasonal management cycle

Time of year	**Management Action**
July	Commence a new year for carcass removal data. Compile data for the previous year.
September	Annual report to Council / Utilities and Roading committee with data from the previous year and any new management options. Update of Management Plan if necessary. Preparatory discussions/meeting with stakeholders prior to the commencement of the summer season.
October	Review of any contracts for services and health and safety documentation.
November	Mow grass at Kaiapoi Wastewater Treatment Plant and other sites if required to enable ease of carcass spotting and collection. Installation of waste disposal bins, if not already kept on site all year.
On-going, particularly in summer and autumn	Review of bird carcass collection frequency. Contact and updates with stakeholder groups. Media release at the advent of an outbreak. Repeat of mowing grass at Kaiapoi Wastewater Treatment Plant and other sites to enable ease of carcass spotting and collection.

4.1. Carcass Removal

Carcass removal of dead birds is carried out on an as-required basis, with removal frequency increasing in proportion to bird death numbers. The frequency of carcass removal could range from every day during the peak of an outbreak, down to weekly. Early installation of collection bins by a hazardous waste collection company, such as Interwaste Ltd, is effective, to ensure a quick response for an outbreak (see Figures 3 to 5 for locations). Ensure collected birds are disposed of safely, as biohazard waste. Pre-emptive grass mowing by WDC around the Kaiapoi Wastewater Plant waterline and any other site with long grass in early summer aids easier spotting and collection of bird carcasses.

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Figure 3: Recommended location of waste disposal bin location (purple dot) at Kaiapoi Wastewater Treatment Plant, near the entrance gate for ease of collection.

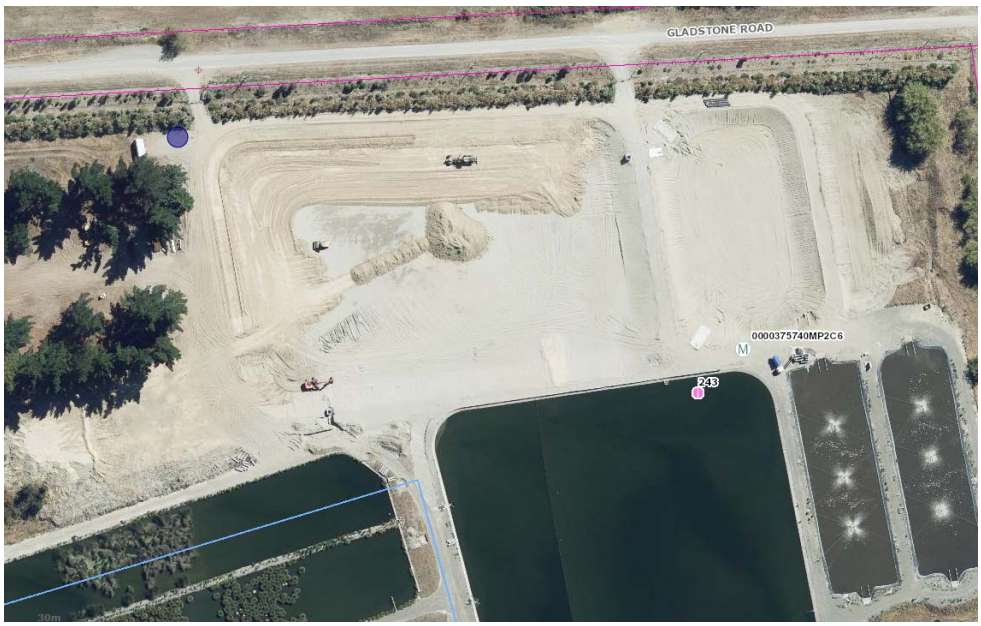

Figure 4: Recommended location of waste disposal bin location (purple dot) at Woodend Wastewater Treatment Plant, near the entrance gate for ease of collection.

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Figure 5: Recommended location of waste disposal bin location (purple dot) at Rangiora Wastewater Treatment Plant.

4.2. Preferred contractors and record keeping

Use of experienced contractors with ecological knowledge of bird species, such as Keystone Ecology Ltd are preferred by WDC for bird carcass removal. Bird carcass disposal should be carried out by an experienced hazardous waste disposal company.

A standardised bird carcass recording sheet has been set up (for example 2017-18 data spreadsheet TRIM 180723081684), which should be replicated for each year (from 1 July – 30 June) on-going as required. Standardisation of data captured will allow comparisons between years, and potentially assessment of effectiveness of any novel management option.

4.3. Rehabilitation of rare and threatened birds

Rare or threatened species (as defined by the New Zealand Species Classification System, Department of Conservation) that are found sick will be rehabilitated where this is feasible. The New Zealand Bird Rescue Charitable Trust has a facility in Christchurch, run by Jackie Stevenson, which is suitable for this rehabilitation. Bird capture may be by grabbing a bird, if too sick to move, or more complex methods, such as the use of net guns. Capture of any bird must first consider and protect the health and safety of humans. Therefore there may be occasions where bird capture is not recommended. For transportation of birds, the New Zealand Bird Rescue Charitable Trust recommends to not feed the bird or give it water but simply place it in a box lined with paper towels and tissues and close the box to reduce stress for the bird. Keep it in a quiet environment until it reaches the rescue centre.

4.4. Stable water levels and water temperature

Maintenance of a stable water level has been recommended by the Department of Conservation to WDC, as fluctuating water levels may increase invertebrate and fish die-offs, creating a protein source for the avian

botulism bacteria. This management option is not recommended at wastewater treatment plants due to the priority to maintain operating capacity, but could be employed in other waterbodies. It could be feasible to install an additional water supply at the Kaiapoi WWTP (i.e. from groundwater) during summer months when water levels drop due to high evaporation rates, if operating capacity was not significantly reduced. This could also help to cool water temperatures to be less suitable habitat for the botulism bacteria. However, an alternative water supply option is not currently available at this site.

4.5. Preventing rotting vegetation and algal mats

Rotting vegetation can also contribute to an outbreak. Therefore WDC should avoid spraying/cutting of macrophytes (water plants) before or during an outbreak, i.e. in the cut-off drain surrounding the Kaiapoi Wastewater Treatment Plant, if feasible. Additionally, it has been suggested that removal of algal mats should be considered for feasibility, with safe disposal from the site. However, removal may be difficult, as the algae tend to disintegrate. Removal of algal mats has not been trialled by WDC, and there were no records found of algal mat removal trials elsewhere. This possible management option is therefore considered as experimental, and should only be pursued with caution.

4.6. Management options not recommended

Barley straw bale installation has been trialled by Auckland Council and other organisations to contain algal/organic material mats that harbour the botulism spores. This management option is not recommended as feasible for effective implementation in WDC wastewater treatment plants, due to disintegration of the bales causing potential problems such as blockages or failure of UV treatment downstream and the large number of bales (several thousand) that would be required. Bird deterrents, such as the use of canons to produce noise, have anecdotally been reported by the ecological contractor providing ornithological advice to WDC to not be effective over a the longer term, as birds become accustomed to the deterrent, and ignore it. WDC staff report that historically LPG gas canons have been previously deployed at Kaiapoi Wastewater Treatment Plant, for reasons other than avian botulism management. The waterfowl however, became accustomed to the sound of the canons, and complaints were received from neighbours.

4.7. Future Management Options

Bird deterrents for temporary relocation of waterfowl, other than LPG gas sound canons, could be evaluated, as recommended by the SPCA review of the WDC Avian Botulism Management Plan (TRIM 201014137227). To-date, however, suitable bird deterrent methods have not be found by previous WDC staff.

Euthanasia of birds could be carried out, via methods recommended by the SPCA review of the WDC Avian Botulism Management Plan.

According to the American Veterinary Medical Association (as of 2019) preferred methods of euthanasing wild birds include:

- Inhaled agents such as anaesthetic, CO_2, and inert gases such as nitrogen and argon. However, these may not be appropriate for birds that can dive unless given at high concentration and for extended period of time. These also require access to proper equipment and trained staff.

- Physical methods such as cervical dislocation, decapitation, exsanguination, and blunt force trauma. When performed by a trained person, these methods are more humane because they lead to rapid death, are safer for workers because they avoid human interaction with toxins in the animal, and are more feasible because they can be performed with equipment that is readily available

- Injectable agents such as injectable anaesthetic, barbiturates, or T-61. These methods require access to agents and skilled personnel, and may not be feasible for large numbers of animals.

TRIM 201103147380

5. Monitoring and Reporting

WDC Wastewater Treatment Plants are monitored regularly by the visiting Water Unit and WDC staff (1-3 times per week) for signs of an outbreak during the summer season. In addition, WDC staff are recommended to monitor long-term weather forecasts for ideal outbreak conditions (i.e. long hot summers and/or warm winters with few frosts).

Records are kept of bird species numbers that are removed, as well as observation notes on i.e. sick birds following the reporting spreadsheet (see example at TRIM 180723081684). The reporting year follows the financial year of 1 July – 30 June.

Reporting of bird species, location, numbers and comments from the contractors will be forwarded, at least weekly, to WDC staff to manage any avian botulism response measures, distribute a weekly update to stakeholders during higher bird death periods, and compiled into an annual summary to be submitted to Council.

WDC staff will report incidences of unusual bird deaths to the Ministry for Primary Industries- Biosecurity New Zealand. WDC staff will advocate to MPI to repeat testing of bird carcasses to confirm avian botulism Type C or another disease, if there is any cause for concern.

6. Health and Safety

- Occupational Health and Safety Management Plan - Keystone Ecology (TRIM 160115002665)
- Draft Site Specific Safety Management Plan and Job Specific Analysis (JSA) for bird carcass collection and wading – Keystone Ecology (TRIM 190204012536)

7. Collaboration and Communication

7.1. Communication plan

There will be clear communication with the public, such as a media release at the advent of an outbreak (see example TRIM 150126009655), and community guides (a pamphlet and Q&A sheet, see Appendix A). The community guides advise the public on the level of risk, and how to report sick and dead birds. Communications within WDC 3 Waters, Water Unit and Greenspace and with contractors will ensure continued sharing of information, such as Health and Safety documents, will continue to be conveyed to WDC staff and contractors.

7.2. Collaborative management

It is recommended to facilitate a joint response to outbreaks with Community Public Health, Christchurch City Council, North Canterbury Fish and Game, Te Rūnanga o Ngāi Tūāhuriri, Te Kōhaka o Tūhaitara Trust, the SPCA, and the management of Pegasus Town.

Te Kōhaka o Tūhaitara Trust (TKoT): The spread of avian botulism to Tūhaitara Coastal Park wetlands in 2014/15 had negative consequences for carcass control, due to the difficulty in recovering the carcasses from this area. Tutaepatu Lagoon in Tūhaitara Coastal Park had 1,000 birds estimated to have died in 2014/15 with only wings remaining, indicating collection was carried out too late. Eels in Tutaepatu Lagoon are thought to have consumed some of the carcasses, which led to over 20 observed eels deaths. This raises a potential

health and safety issue, due to the collection of eels as a food source. An offer of bird carcass disposal in WDC-hired bins is recommended to be offered to TKoT on an as required basis.

Te Rūnanga o Ngāi Tūāhuriri: Outbreaks of avian botulism could restrict the ability to carry out mahinga kai (customary food-gathering) of both waterfowl and eels.

Community Public Health: Consumption of waterfowl and eels could be an unknown human health risk.

North Canterbury Fish and Game: Hold a role to protect the quality of waterfowl game for hunters, and to protect hunters from any potential illness.

Templeton Group - managers of Pegasus Town: own land wetlands around Pegasus between the Kaiapoi and Woodend Wastewater Treatment Plants, which may be effected by an outbreak.

Department of Conservation: Have a responsibility to care for native biodiversity, particularly if rare or threatened.

Christchurch City Council: The Council has had large outbreaks at Bromley Wastewater Treatment Plant in the recent decade, with significant waterfowl deaths.

SPCA: The SPCA has offered support with outbreak management and bird rehabilitation advice.

8. Budget

An indicative future costs for management of avian botulism if there is a significant outbreak is $50,000 per year, based on the cost of bird carcass removal for 2017-18, however costs will fluctuate significantly dependent on the level of outbreak.

2017-18 Costs
$41,980 (excl. GST) for the bird collection by Keystone Ecology Ltd, an ecological services contractor.
$5,773 (excl. GST) for bin rental, collection and disposal in 2017-18 for the waste disposal contractor San I Pak Ltd.

Costs to-date have come from within WDC Wastewater budgets, including for areas such as stormwater ponds and reserve areas. This may need to be re-evaluated if significant costs arise from outside of WWTP areas.

A minimal new cost in the form of a donation to the New Zealand Bird Rescue Charitable Trust, is proposed in the case of required rehabilitation of a rare or threatened bird. This donation is set at the discretion of WDC. To date, no sick birds that are rare or threatened have been sighted by the ecological contractor. The cost of management is reduced by efficient monitoring, quick response and a coordinated response with other parties, such as the Christchurch City Council.

TRIM 201103147380

APPENDIX A. Public communications materials

Information pamphlet (TRIM 190204012544)

Avian Botulism

Is avian botulism a threat to me?

Avian botulism cannot be contracted by humans but take the following procautions:

- Don't let pets eat dead birds/waterfowl (or fish)
- Don't handle dead birds/waterfowl (or fish) with bare hands
- Don't harvest sick or dying birds/waterfowl (or fish).

What if i see a sick bird?

If you discover an unwell bird you can take it to Bird Rescue Christchurch. Please follow the safety precautions above when handling sick waterfoul.

Bird Rescue Christchurch
2A Glen Place Parklands, Christchurch
Phone: (03) 383 1488
Email: gary.stevenson@xtra.co.nz

For more information go to:
waimakariri.govt.nz - search "avian botulism".

WAIMAKARIRI DISTRICT COUNCIL waimakariri.govt.nz

What is avian botulism?

- It is a disease causing lethargy, paralysis and can lead to death in birds (most commonly waterfowl). It cannot be contracted by humans
- Toxins produced by the *Clostridium botulinum* bacteria infect birds – even a small amount of the toxin can harm birds
- *Clostridium botulinum* is naturally occurring in soils present in ponds and wetlands. It's harmless until triggering environmental factors occur simultaneously – such as hot and humid weather
- Avian botulism proves to be very stubborn and difficult to eliminate because of the naturally occurring bacteria that produces the toxin. However, there are ways to mitigate its spread.

How does avian botulism spread?

The majority of outbreaks are caused by ducks eating maggots that have fed off dead birds. This diagram illustrates the lifecycle of the disease.

Dead bird - maggot cycle

Our mitigation measures

- Swift removal of dead birds/waterfowl. This helps break the infection cycle
- Providing waste bins and bags for pet waste at select local parks.

How you can help reduce avian botulism?

- Avoid feeding the ducks. It's best if they forage naturally
- Don't feed bread to ducks. If it's not eaten, it can rot in the pond and promote growth of botulism bacteria
- If you do feed the birds/waterfowl, please feed them on land and with seeds and grains. These are also best for them
- Pick up and properly dispose of your pet's waste
- Contact the Council if you see a sick or dead duck *(if you think it may have avian botulism)*. If you live rurally, please bury any dead birds
- Share what you now know about the topic with family and friends so they can help to reduce its spread.

TRIM 201103147380

Q&A Infosheet (TRIM 190204012546)

FREQUENTLY ASKED QUESTIONS

Avian Botulism

What is avian botulism?

- It is a disease causing lethargy, paralysis and can lead to death in birds (most commonly waterfowl). It cannot be contracted by humans
- Toxins produced by the Clostridium botulinum bacteria infect birds – even a small amount of the toxin can harm birds
- Clostridium botulinum is naturally occurring in soils present in ponds and wetlands. It's harmless until triggering environmental factors occur simultaneously – such as hot and humid weather
- Avian botulism proves to be very stubborn and difficult to eliminate because of the naturally occurring bacteria that produces the toxin. However, there are ways to mitigate its spread.

How does avian botulism spread?

- The majority of outbreaks are caused by ducks eating maggots that have fed off dead birds.

What are the Council's mitigation measures?

- Swift removal of dead birds/waterfowl, helping break the infection cycle
- Providing waste bins and bags for pet waste at selected local parks.

How can I help reduce avian botulism?

There are a number of things you can do:

- Avoid feeding the ducks. It's best if they forage naturally
- Don't feed bread to ducks. If it's not eaten, it can rot in the pond and promote growth of botulism bacteria
- If you do feed the birds/waterfowl, please feed them on land and with seeds and grains. These are also best for them
- Pick up and properly dispose of your pet's waste
- Contact the Council if you see a sick or dead duck *(if you think it may have avian botulism)*. If you live rurally, please bury any dead birds
- Share what you now know about the topic with family and friends so they can help to reduce its spread.

Is avian botulism a threat to me?

Avian botulism cannot be contracted by humans so the risk to humans is considered very small. But it's still important to protect your health and the health of your pets. Here's how:

- Don't let pets eat birds/waterfowl (or dead fish)
- Don't handle birds/waterfowl (or dead fish) with bare hands
- Don't harvest sick or dying birds/waterfowl.

What if i see a sick bird?

If you discover an unwell bird you can take it to **Bird Rescue Christchurch**. Please follow the safety precautions above when handling sick waterfoul.

Bird Rescue Christchurch can be found at:
2A Glen Place Parklands, Christchurch
Tel: (03) 383 1488 and Email: gary.stevenson@xtra.co.nz

For more information go to: waimakariri.govt.nz - search "avian botulism".

WAI DISTRICT COUNCIL

akariri.govt.nz

WAIMAKARIRI DISTRICT COUNCIL

REPORT FOR INFORMATION

FILE NO and TRIM NO:	SEW-03-01-05 / 220511075308
REPORT TO:	UTILITIES AND ROADING COMMITTEE
DATE OF MEETING:	21 June 2022
AUTHOR(S):	Sophie Allen – Water Environment Advisor Kalley Simpson – 3 Waters Manager
SUBJECT:	Midge management and monitoring at wastewater treatment plants
ENDORSED BY: (for Reports to Council, Committees or Boards)	Department Manager / pp Chief Executive

1. SUMMARY

1.1. This report details work to control the nuisance of non-biting midges, such as the native species *Chironomus zealandicus*, for localised neighbours of the Kaiapoi and Woodend wastewater treatment plants (WWTPs).

1.2. Midge management plans prepared for Kaiapoi WWTP historically focused on insecticide usage. Due to environmental concerns of insecticide usage, insecticide resistance, costs and other practicalities, alternative methods to insecticides have been trialled; namely larval disruption dredging in summers the 2020-21 and 2021-22 at the Kaiapoi WWTP, and vegetable oil surfactant spraying 2021-22 at the Woodend WWTP.

1.3. This report summarises;

1.3.1. the costs and benefits of the larval disruption dredging and vegetable oil surfactant management techniques that have been trialled at the Kaiapoi and Woodend WWTPs.

1.3.2. midge monitoring results for the summer of 2021-22 from Woodend and Kaiapoi wastewater treatment plants following the installation of midge emergence traps.

1.3.3. midge monitoring results for a trap temporarily placed within the Eastern Conservation Management Area, a wetland area beside Pegasus township.

1.3.4. the proposed midge monitoring and management for 2022-23 and beyond.

1.4. Results to-date have anecdotally supported the successful results of the larval disruption dredging and vegetable oil surfactant from reports from neighbours. Midge emergence monitoring does not show a strong correlation of midge population reduction with treatment. However problems with maintaining control and treatment areas for the dredging and oil surfactant applications has made correlation of any effect of the treatments difficult to assess. This issue should be addressed for future monitoring if possible.

1.5. A replacement insect control management plan is intended to be drafted for Kaiapoi Wastewater Treatment Plant, focusing on non-insecticide control methods of larval disruption dredging and vegetation screening, to submit to Environment Canterbury as a update of the plan required to satisfy the conditions of consent CRC041049.

Attachments:

i. Memo on alternative methods to insecticide, November 2018 (TRIM 181123138028)

2. RECOMMENDATION

THAT the Utilities and Roading Committee

(a) **Receives** Report No. 220511075308.

(b) **Notes** the use of the larval disruption dredging and oil surfactant spreading techniques that have been trialled at Kaiapoi and Woodend Wastewater Treatment Plants (WWTPs) for midge management.

(c) **Notes** that midge trap monitoring was not able to demonstrate if trialled management techniques reduced midge densities, however anecdotal evidence from neighbours supports continued use of the practises.

(d) **Notes** the cost of midge management for Kaiapoi and Woodend WWTP is estimated to have been approximately $30,000 for the 2021-2022 season, sourced from existing operational budgets, and is subsidised by avian botulism inspections that means that ecological contractors are already on-site to carry out midge trap monitoring.

(e) **Notes** that native planting and bunding is intended to be installed at the Woodend WWTP on the western boundary to replace pine forest screening that has been removed by logging, however the supply of bund material from construction of a Stormwater Management Area has been delayed.

(f) **Notes** the intended approach of submitting a new insect control management plan for Kaiapoi Wastewater Treatment Plant, focusing on non-insecticide control methods, to Environment Canterbury as a condition of consent CRC041049.

3. BACKGROUND

3.1. The presence of native non-biting midge species, *Chronomus zealandicus*, has generated service requests and unofficial complaints from neighbour residents of the Kaiapoi and Woodend WWTPs, where the midges are breeding. The complaints are particularly from a residents on the western sides of the plants, which is likely due to the prevalent wind direction from the north-east.

3.2. There is an Environment Canterbury consent requirement to have an insect control management plan under consent CRC041049 for the Kaiapoi WWTP. An insect control management plan was lodged with Environment Canterbury in February 2006. Under consent CRC041049 for Kaiapoi WWTP the consent holder (WDC) shall supply to the Canterbury Regional Council within three months of granting of the consent an Insect Control Management Plan. This plan shall include but not necessarily be limited to:

3.2.1. Surveillance methodology

3.2.2. Control methodology

3.2.3. Trigger levels

3.2.4. Consultation with community

3.2.5. Reporting

3.2.6. Review

3.3. A Kaiapoi Wastewater Treatment Plant – Midge Control Plan was prepared by CH2M Beca in December 2017 (see TRIM 180307023727). The report recommended the usage of insecticides s-methoprene, etofenprox and spinosad, as well as implementing monitoring using emergence and light traps. This plan was primarily not enacted, due to concerns of

insecticide effectiveness and resistance, and cost raised by the Wastewater Asset Manager at the time, Chris Parton.

3.4. A memo with selected options for non-chemical control was presented to the subsequent Wastewater Asset Manager Gavin Hutchinson in November 2018 (TRIM181123138028), which proposed modifications to private houses, vegetation screening, and creating deliberate flyways among other options. Modifications to private houses, such as decreasing or screening night-time lighting, is only possible with the cooperation of the private landowners, however is potentially a very cost-effective measure.

3.5. Due to the expense, environmental concerns, and resistance of midges to repeat insecticide treatment, WDC staff have conducted a trial of a range of alternative management options in 2020-2022, namely midge larvae dredging disruption which drowns midge larvae, and application of a vegetable oil surfactant which prevents midge emergence of adults from the water surface due to oil coating their wings.

3.6. Additional midge management techniques for Kaiapoi and Woodend WWTPs include vegetation screening to prevent neighbouring house lights from being visible. A shade cloth fence was installed at Kaiapoi WWTP which provides some screening. Bunding and native planting is planned for the western side of Woodend WWTP however installation has been delayed. Flood-lighting has been increased on the south side of the Kaiapoi WWTP wetlands beside the outlet pump shed as an attractant to divert midges away from the neighbours to the west.

4. ISSUES AND OPTIONS

Midge concerns by neighbours

4.1. One neighbour on Ferry Road (opposite the western side of the Kaiapoi Wastewater Treatment Plan) has contacted WDC multiple times each summer season to complain of high midge numbers causing nuisance issues. This neighbour is on the western side of the Wastewater Treatment Plant. With the prevailing wind direction from the north-east, it is assumed that the western direction is most effected by midges from the WWTP due to being downwind.

4.2. A handful of property owners on the western side of the Woodend Wastewater Treatment Plant raised concerns about increased midge numbers over the summer of 2021-22. This increase is highly likely due to the removal of pine vegetation at the WWTP site that was shielding attractant lights of the neighbours' houses and providing shelter for the midges during wind.

Midge management costs and benefits

Larval disruption dredging

4.3. Dredging of sediment has been successfully trialled by Christchurch City Council at Bromley WWTP. Due to a greater depth, a jet boat is used at Bromley WWTP to pull the dredge. Due to a shallower depth at Kaiapoi WWTP wetlands an excavator is used. Figure 1 shows the midge dredge that is used within the wetlands at Kaiapoi WWTP to stir up the bed, resulting in drowning of the midge larvae who lose their breathing tubes.

4.4. Due to the fast lifecycle of midges in the summer months, which can be as short as two weeks, ideally dredging frequency would be every few weeks, particular with warm settled weather. Over the summer of 2021-22 dredging was carried out five times, at a cost of $3,000 (excl GST) per time.

4.5. Dredging has not been proposed for the wetlands at Woodend WWTP which has extensive wetland planting, as an area of open water is required for the excavator and dredge to be able to manoeuvre.

Figure 1: The dredge that has been designed by 3 Waters staff for use at Kaiapoi WWTP, and nicknamed the 'the Midge-buster'

Figure 2: Larval disruption dredging in action, otherwise known as 'midge-busting'

Vegetable oil surfactant spreading

4.6. A small amount of vegetable oil has been applied three times over the summer 2021-22 at Woodend WWTP to the constructed wetland areas. The oil spreads out very thinly over the surface of the water, creating a film that prevents emerging midge adults from being able to fly by coating their wings. The cost per application was about $370 excl GST. Ideally the frequency of use of this product could be weekly, due to the oil dispersing quickly.

4.7. The oil surfactant is more suitable for use in areas with wind protection that prevent the oil being blown towards one end of the wetland, decreasing effectiveness. Therefore, oil surfactant is not recommended to be spread at Kaiapoi WWTP because the large area of the wetland receiving high wind fetch.

Vegetation screening

4.8. Native vegetation screening at Woodend WWTP is proposed to be installed on the western boundary following the removal of pines trees for harvesting in 2021. The removal of the pines led to an increase in complaints from neighbours about an increase in midge numbers around their houses.

4.9. Bunding on the western side of Woodend WWTP, with additional screening by native plantings, was planned for installation in winter 2022, however have been delayed by resource consent issues for the Mill Road Stormwater Management Area in Ohoka that has delayed the supply of material for the bund.

4.10. The WDC Property Team is also overseeing the planting a 10 metre-wide strip of low-flammable natives this winter to provide screening of users of a recreational track from the

neighbouring properties on Gladstone Road. This track screening will also likely provide some screening of light from the neighbouring houses to prevent the attraction of midges, until the additional bunding and planting at the Woodend WWTP can be put in place.

Environmental considerations of management methods

4.11. During the summer 2021-22 Kaiapoi WWTP experienced odour issues that was identified to be due to benthic cyanobacterial mats growing in the Kaiapoi WWTP wetlands during a period of dry and settled weather. These mats detached from the bed and washed ashore primarily on the western side of the wetland where exposure to air led to decomposition and odour creation. The potential effect of dredging in lifting of the algal mats from the bed was raised. Lifting of mats in areas that were not dredged however were also observed. It is assumed that the usual mechanism of gas creation within the mats leads to the lifting of the mats off the bed, with the odour issue not driven by the dredging work. Raising of water level within the wetland improved the odour issue, by covering the decomposing algal mats.

4.12. It has been raised that larval disruption by dredging reduces the food supply available for waterfowl, as midge larvae is a common food source. However other factors such as habitat might be a limiting factor for waterfowl populations, rather than food supply. Christchurch City Council ecological monitoring of the wider Brooklands Lagoon bird population has not identified any reduction in the waterfowl population at Kaiapoi WWTP, therefore food supply is not thought to be a limiting factor, and dredging is potentially not a concern for bird populations except for the temporary disturbance of the excavator.

Midge Monitoring

4.13. Feedback and complaints have been received by neighbours to the west of both the Kaiapoi and Woodend WWTPs, which is recorded by 3 Waters staff. This information is very useful to assess the when midges are causing issues, and also whether treatments have potentially reduced midge populations. Feedback has been generally positive for both the larval disruption dredging and oil surfactant spreading treatments.

4.14. Midge emergence traps (see Figure 3) have been deployed over the spring-autumn months in 2020-21 and 2021-22 to capture midges as the transform from larvae in the sediment to flying adults. A sticky paper collects the emerged adults at the top of the trap, and allows for a density count of how many midges are emerging over time. It is assumed, due to the short lifespan of the adults (of a maximum of 5 days), that midge trap numbers indicate the density of the adult population present around the wastewater treatment plant.

4.15. In Kaiapoi WWTP four midge emergence traps were assigned to small ‘no-dredge’ control areas, and four traps to the main ‘dredged’ area (see Figure 4), however due to the proximity of the traps to the bank, it was found out by 3 Waters staff that none of the traps were in located areas that were dredged in 2020-21. Efforts were made to dredge the traps in the ‘dredged’ area in the summer 2021-22 once discovered that the trap areas were not being dredged.

4.16. Two midge emergence traps were place at Woodend WWTP for the first time in the 2021-22 season. Due to the inability to prevent the spread of the oil over the entire surface of the wetland, and the low number of traps, no midge traps are in a ‘control’ area to compare what happens if oil is not applied.

Figure 3: A midge emergence trap

Figure 4: Midge emergence trap locations of the eight traps at Kaiapoi Wastewater Treatment Plant. Pink areas indicate the proposed 'no-dredge' control areas, however 'dredged' treatment areas and 'no-dredge' control areas were not followed by contractors until midway through the 2021-22 season.

Figure 5: Midge emergence trap locations (red pins) of the two traps at Woodend Wastewater Treatment Plant during the summer and autumn of 2021-22.

Figure 6: The site (red pin) within the Pegasus Eastern Conservation Management Area accessed from the end of Gladstone Road (ECMA) that was temporarily trapped in 2021-22 to provide wider context of insect emergence from waterbodies in the Woodend area.

Monitoring results and discussion

4.17. Midge emergence data for the traps at Kaiapoi WWTP generally showed a gradually decrease over time, with the worst time for midges in spring and early summer, with the exception of some large, and potentially localised, emergence events at trap 2 and trap 7 (see Figure 7).

4.18. It is recommended that midge traps monitoring commences earlier in spring, i.e. September, as complaints were received already by the neighbour on the western boundary in October, and midge trap data indicates that the start of the midge emergence season is not being captured currently.

4.19. For dredging the contractor generally dredges all of the infiltration wetland that is accessible. However close to shore has not been possible to dredge. This led to an inability to follow the experimental design of some midge traps within the dredged areas and some within a no-dredge control area. In reality all traps were not located far enough away from shore to be in the dredged areas in the 2020-21 season, and only some traps were located in the dredged areas in the 2021-22 season. Therefore unfortunately no comparison of control and treatment areas can be made.

4.20. Woodend WWTP experienced a late peak in midge numbers than Kaiapoi WWTP (i.e. in March, see Figure 8). This peak possibly combined with increased mosquito issues, as noted from neighbour reports of biting insects also being present. This could have been due to a wetter summer than usual, with temperatures that remained warm into autumn.

4.21. Limited monitoring from one trap in the Eastern Conservation Management Area, accessed from the end of Gladstone Road, indicated that a wider range of species were emerging in general, however one spike in midge numbers was captured in early December 2021 before monitoring was ceased, indicating that the ECMA can also be a source of midges for the local residents.

4.22. Dates when larval disruption dredging was carried out at Kaiapoi WWTP were: 12/11/2021, 26/11/2021, 10/12/2021, 21/12/2021 and 24/01/2022.

4.23. Dates when oil surfactant was applied at Woodend WWTP were: 30/11/2021, 21/12/2021, and 15/03/2022.

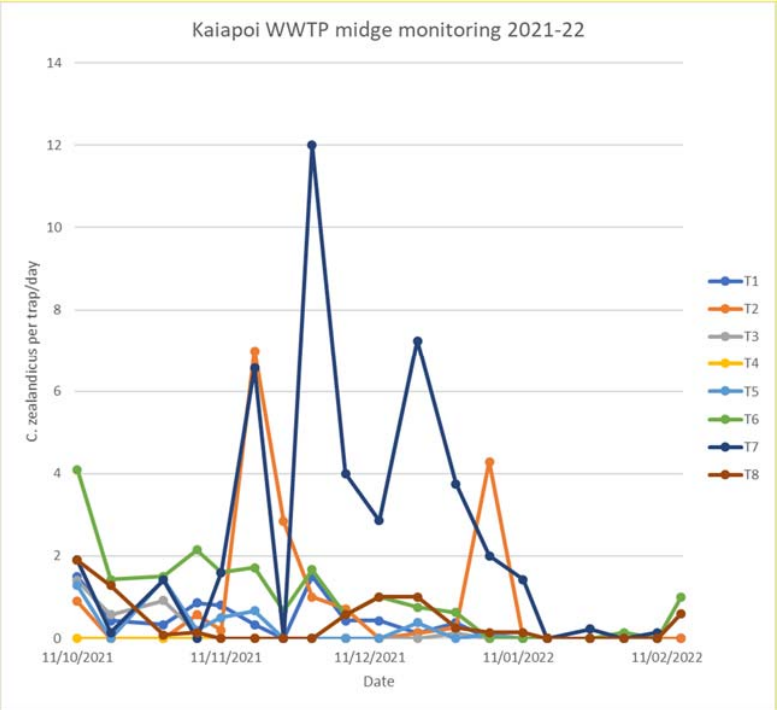


Figure 7: Midge emergence trap data for the eight traps at Kaiapoi WWTP, averaged to catch rates per day (from TRIM 220526086500)

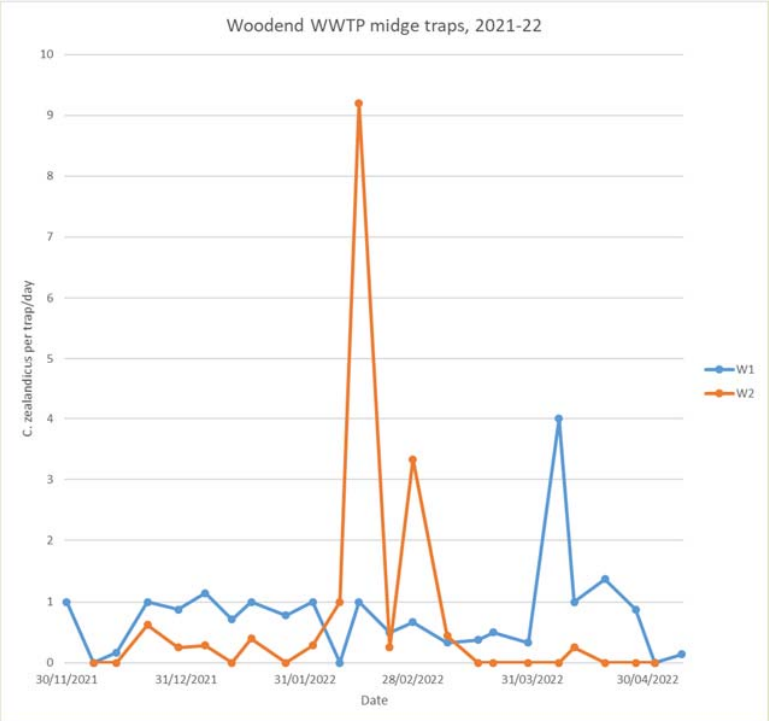


Figure 8: Midge emerge trap data for the two traps at Woodend WWTP, averaged to catch rates per day (from TRIM 220526086499)

4.24. A summary of the key improvements to the future midge monitoring and management for 2022-23 and beyond is provided in the following table.

Table 1: Future midge monitoring and management improvements

Site	Improvement
Woodend & Kaiapoi WWTP	Midge trap monitoring to commence earlier in spring to ensure the midge emergence season is captured.
Kaiapoi WWTP	Traps are to be located far enough away from shore to ensure they are located in the areas that can be dredged by the contractor.
Kaiapoi WWTP	Ensure the contractor undertaking the dredging is aware that the control 'area' is not to be dredged but the 'dredged' area is to be dredged.
Woodend WWTP	Traps are also to be placed in a 'control' area at the Woodend WWTP.

Implications for Community Wellbeing

4.25. There are implications on community wellbeing by the issues and options that are the subject matter of this report, particularly for the localised neighbours to the western side of each WWTP.

4.26. The Management Team has reviewed this report and support the recommendations.

5. COMMUNITY VIEWS

5.1. Mana whenua

5.1.1. Te Ngāi Tūāhuriri hapū are likely to be affected by, or have an interest in the subject matter of this report, such as midge management treatments that are used and in particular any environmental benefits or costs of the management treatment on the wider ecosystem.

5.2. Groups and Organisations

5.2.1. There are localised neighbours to the Kaiapoi and Woodend wastewater treatment plants that are affected by, and have an interest in the subject matter of this report. The Woodend neighbours of the WWTP have created a consultation group with 3 Waters staff regarding wider WWTP consultation, which includes on-going discussion of midge management.

5.3. Wider Community

5.3.1. The wider community is not likely to be affected by, or to have an interest in the subject matter of this report.

6. OTHER IMPLICATIONS AND RISK MANAGEMENT

6.1. Financial Implications

6.1.1. There are not financial implications of the decisions sought by this report. Midge management is covered by existing operational budgets for the WWTPs. A midge management budget is already provided for in the Annual Plan for 2022-23.

6.2. Sustainability and Climate Change Impacts

6.2.1. The recommendations in this report do have sustainability and/or climate change impacts. The consideration of environmental effects of on-going midge management measures, such as reduction of food

6.3 Risk Management

6.2.2. There are risks arising from the adoption/implementation of the recommendations in this report that midge management will not result in sufficient midge number reductions for neighbours. Midge management is likely to be an on-going

6.3 **Health and Safety**

6.2.3. There are no new specific health and safety risks arising from the implementation of the recommendations in this report. Contractors are required to access the wastewater treatment plant wetlands, which contain treated effluent. Therefore contractor site induction and other specific health and safety measures appropriate to the hazards present are carried out.

7. CONTEXT

7.1. **Consistency with Policy**

7.1.1. This matter is not a matter of significance in terms of the Council's Significance and Engagement Policy.

7.2. **Authorising Legislation**

7.2.1. There are requirements for insect control under consent issued under the Resource Management Act (1991).

7.3. **Consistency with Community Outcomes**

7.3.1. The Council's community outcomes are / are not relevant to the actions arising from recommendations in this report.

7.4. **Authorising Delegations**

7.4.1. This report is for information only. No delegations apply.

WAIMAKARIRI DISTRICT COUNCIL

MEMO

FILE NO AND TRIM NO:	SEW-12 / 181123138028
DATE:	26 November 2018
MEMO TO:	Gavin Hutchinson – Wastewater Asset Manager Rob Frizzell - Wastewater Engineer
FROM:	Sophie Allen – Water Environment Advisor
SUBJECT:	Midge management at the Kaiapoi WWTP

Introduction:
The presence of native non-biting midge species, *Chronomus zealandicus,* has generated Service Requests and unofficial complaints from neighbour residents of the Kaiapoi Wastewater Treatment Plant, where the midges are breeding. The complaints are particularly from a resident on the western side, which is likely due to the prevalent wind direction from the east.

Under consent CRC041049 The consent holder (WDC) shall supply to the Canterbury Regional Council within three months of granting of the consent an Insect Control Management Plan. This plan shall include but not necessarily be limited to:

- Surveillance methodology
- Control methodology
- Trigger levels
- Consultation with community
- Reporting
- Review

A Kaiapoi Wastewater Treatment Plant – Midge Control Plan was prepared by CH2M Beca in December 2017. The report recommended the usage of insecticides s-methoprene, etofenprox and spinosad, as well as implementing monitoring using emergence and light traps. This plan was not enacted, due to concerns of effectiveness and cost raised by the Wastewater Asset Manager, Chris Parton.

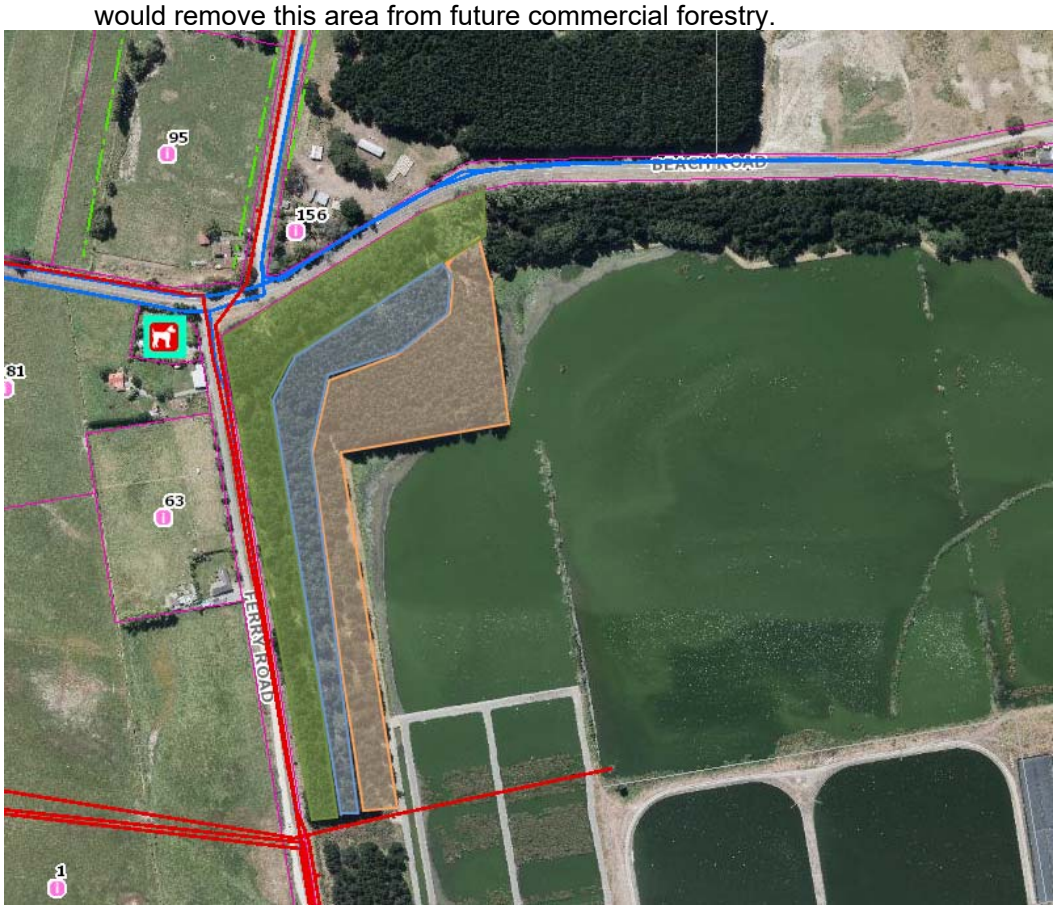
I visited CCC Operations Manager, Adam Twose, in October 2018, and received a tour of the Bromley WWTP oxidation ponds. Adam Twose believed that s-methoprene spraying at the Bromley WWTP did not result in a noticeable decrease in midge numbers and complaints beyond an initial period of approximately a month. The failure of the s-methoprene maybe have been because of only targeting the margin areas, and a dosing rate believed by Adam Twose to not be sufficient. However with correct dosage rates, there would have been a substantive financial cost. S-methoprene resistance is also known to build within a population, decreasing efficiency of the insecticide.

An oil surfactant product was applied to the oxidation ponds at the Kaiapoi WWTP in 2016/2017, which was intended to reduce successful emergence of the midge. It is unknown whether this was successful, however it was noted that the surfactant was not effective at covering the surface during the regular winds the WWTP receives.

After a review of scientific and anecdotal literature regarding the control of the midge *Chronomus zealandicus,* I propose a series of changes to the layout of the WWTP in the long-term, as well as interventions at the residents' properties. This is due to long-term cost-effectiveness and reduced potential human health risks (i.e. chemical exposure) as compared to short-term benefits of insecticide and surfactant oil application.

Recommendations:

1. Vegetation screening (see Map 1).
   An area of permanent native planting is proposed to face residences at the WWTP site. This native planting will be high and thick enough, when established, to block out any light from the nearby residences, to remove this attractant to the private properties. This will require removal of the existing pine plantation, possibly before the due harvest date, and would remove this area from future commercial forestry.



Map 1: Green indicates an area of native plant screening and amenity. Blue indicates the 'midge collection corridor' with open space which could also function as a forestry access track. Orange indicates the area where pine forestry could be maintained.

2. Midge dispersal pathway management

   It should be noted that dispersal pathway management is an experimental technique, based on information from the CCC Operations Manager, Adam Twose and used at Mangere WWTP in Auckland.

An experimental technique uses knowledge of midge flight patterns to detract them from residences. Beside the native planting will be an open area that is intended to function as a ‘flyway’ for the midges, to encourage them to move north and south on the leeside of the pine plantation, not westwards towards the worst effected residences. The creation of an intentional ‘flyway’ on the leeside of the pine plantation is experimental, but has been anecdotally used at Mangere WWTP in Auckland, and is has been noted to exist at Bromley WWTP in Christchurch, where a line of pines has incidentally created a ‘flyway’, which has however resulted in complaints by residents at the end of the ‘flyway’.

3. Resident engagement and minor modifications to houses

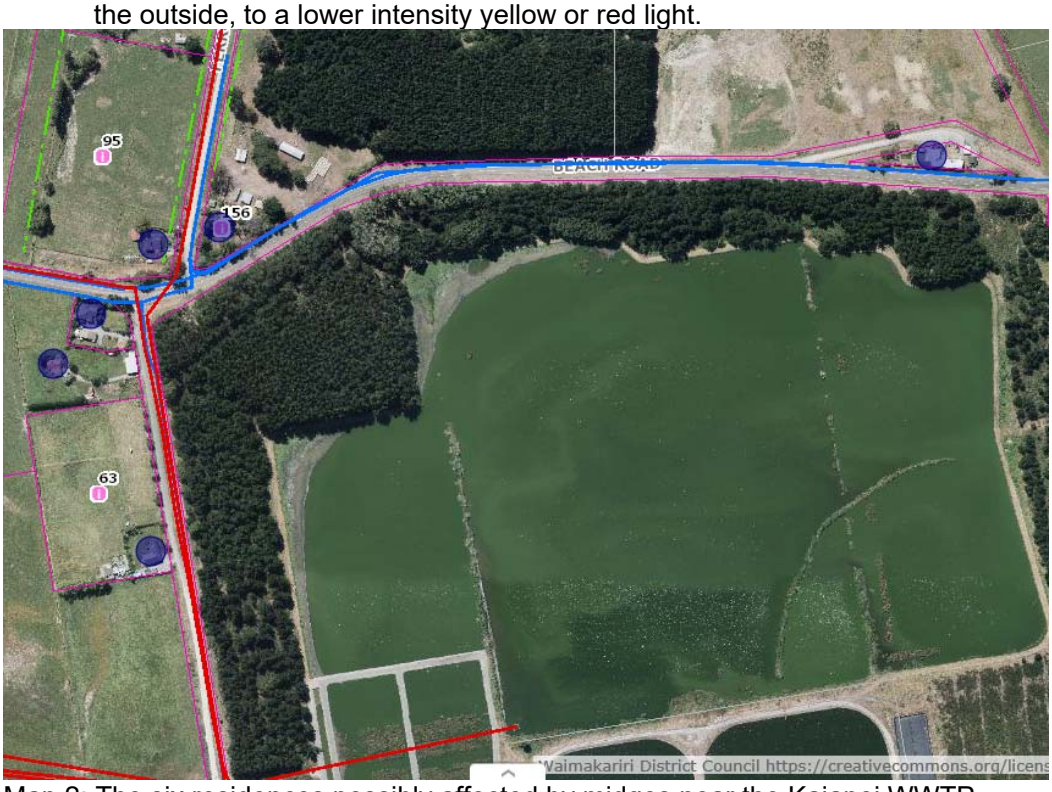
Education can be provided to residents on what are common midge attractants (i.e. bright lights, light-coloured surfaces and eaves of a house), and behaviours that reduce midge exposure such as shutting doors and turning off lights.

Small modifications to six residences within close proximity to the WWTP are recommended (see Map 2). These are recommended to be funded by WDC, rather than the private landowner.

a. Installation of light-reducing curtains and blinds.

b. Exterior surface painting from a light colour to a dark colour (reference)

c. Lightbulb replacement for any bright white lights outside, or inside if visible from the outside, to a lower intensity yellow or red light.



Map 2: The six residences possibly affected by midges near the Kaiapoi WWTP.

4. Light traps/ light distraction

High intensity white light stations could be set up around the Kaiapoi WWTP. Preferably away from the direction of residences, and located near an existing power source at the

WWTP to reduce installation cost. These light stations could be switched on in spring and summer at night when midge numbers are at their peak, or all year if a benefit was shown. The lights can be just detractants which prevent dispersal to residences, or they can be incorporated with a trap that kill the adult midges. Health and safety considerations of staff should be considered for death trap installation, as well as the efficacy of killing midges adults earlier than their already naturally-short adult life.

5. Further ideas to explore

    - Reduction of the oxidation pond size (to be scoped by CH2M Beca in early 2019)
    - Increased depth of oxidation ponds
    - Concreting of the oxidation pond margin to remove shallow habitat where midge larvae tend to thrive.

Monitoring:

Light traps and emergence traps can be used for monitoring for midge numbers, usually bi-weekly, as per the Midge Control Plan prepared by CH2M Beca in December 2017.

WAIMAKARIRI DISTRICT COUNCIL

REPORT FOR DECISION

FILE NO and TRIM NO:	RDG-06-02 / 220526085607
REPORT TO:	OXFORD OHOKA COMMUNITY BOARD
DATE OF MEETING:	8th June 2022
AUTHOR(S):	Shaun Maxwell – Roading Compliance Officer Joanne McBride – Roading & Transport Manager
SUBJECT:	Approval to install two cattle stops on Carleton Road, between Harewood Road and Woodstock Road.
ENDORSED BY: (for Reports to Council, Committees or Boards)	Department Manager / Chief Executive

1. SUMMARY

1.1. This report is to obtain the Boards approval to install two cattle stops and associated fences and gates in Carleton Road, between Harewood Road and Woodstock Road, to enable the adjoining dairy farmer to move cows across Carleton Road in a more efficient and safe manner.

1.2. Carleton Dairies owns land on both sides of Carleton Road and as part of the operation moves stock across Carleton Road on a daily basis, and has a current stock crossing permit for this location. The current method of doing this is to open the gates on each side of the road and put electric tapes across the road before letting the cows cross Carleton Road with minimal supervision.

1.3. As Carleton Road is a low volume road, this method has worked satisfactorily, however this method does cause an inconvenience and there is a risk cows may escape through the electric tapes and therefore Carleton Dairies has requested approval to install cattle stops and fencing and gates each side of the crossing. Cattle stops will prevent cows from escaping along Carleton Road and at the same time vehicles will be able to use the road normally. Appropriate signage will be installed to warn motorists of the cattle stops ahead.

1.4. There have been previous approvals for the installation of cattle stops on various roads within the district, for the same purpose as the proposed cattle stops in Carleton Road. All of these cases are working well and so it is recommended the cattle stops are approved for Carleton Road. Carleton Dairies has previously received approval for and installed cattle stops on Woodstock Road in September 2018, and Carleton Road in 2021.

1.5. The alternative is an underpass, however this cannot be justified on Carleton Road as it is a low volume road, and the cost of installing infrastructure would be high.

1.6. All costs for the construction and the ongoing maintenance of the cattle stops and associated fences and gates will be met by the property owner and this will be covered by a standard Council Licence to Occupy Agreement. This agreement enables the Council to require the cattle stops to be removed if for some reason circumstances change in the future.

Attachments:

i. Draft Licence to Occupy Agreement (Trim no. 220526085664)
ii. Cattle Stops Location Diagram (Trim no. 220526085662)

2. RECOMMENDATION

THAT the Oxford-Ohoka Community Board:

(a) **Receives** report No. 220526085607.

(b) **Approves** the construction of two cattle stops and associated fences and / on Carleton Road at the location shown on the attached diagram (Trim no. 220526085662) for the purpose of enabling the efficient movement of cows across Carleton Road while at the same time keeping the road safe and accessible for road users.

(c) **Approves** the attached Draft Licence to Occupy Agreement (Trim no. 220526085664).

(d) **Notes** that all costs associated with the construction, maintenance and removal of the cattle stops, fences, gates and sealing of the road and up to and between the stops will be met by the property owner.

(e) **Notes** that the property owner will be required to remove the cattle stops, fences and gates if and when they cease dairy farming operations or if they change their method of operation that does not require the regular movement of cows across Carleton Road.

(f) **Circulates** this report to the Utilities and Roading Committee for information.

3. BACKGROUND

3.1. Carleton Dairies owns land on both sides of Carleton Road and moves cows across Carleton Road on a daily basis. The current method of putting electric tapes across the road and allowing the cows to cross on their own with minimal supervision has worked in the past because Carleton Road carries low traffic volumes, however there are risks associated with this method. Cows could escape and cause traffic safety issues. Drivers may not see the tapes and drive into them.

4. ISSUES AND OPTIONS

4.1. There are a number of options that are available to improve the current situation. They include:

- Option 1 – Farmer installs cattle stops on Carleton Road on each side of the crossing point with associated fences and gates as requested and as recommended.
- Option 2 – Require the farmer to continuously supervise and control the cows across Carleton Road at all times
- Option 3 – Require the farmer to construct a cattle underpass.
- Option 4 – Do nothing.

4.2. Option assessment.

Option 1 – Farmer installs cattle stops on Carleton Road on each side of the crossing point with associated fences and gates as requested and as recommended.

Advantages	Disadvantages
Creates a highly visible crossing, and slower vehicle speeds through perceived narrowing of the road, and the uneven surface of the cattle stops.	Provides an inconvenience to horse riders and walkers along Carleton Road in that they will have to open and close gates. (Gates would be left open when cows are not crossing)

Cheaper and are more appropriate at this location than an underpass.	Could become a Council liability if the property owner does not properly maintain the cattle stops, fences and gates.
No cost to Council.	Drivers may not see cows crossing the road. This is unlikely as visibility is good and signs will be in place to warn drivers of the cows.
Enables cows to cross Carleton Road with minimal supervision and at the same time allowing unrestricted movement of vehicles, except when cows are crossing. (Signs would need be in place to warn drivers when cows are crossing)	

Option 2 – Require the farmer to continuously supervise and control the cows across Carleton Road at all times.

Advantages	**Disadvantages**
Fully supervised so very low risk of cows escaping or vehicles and other road users being inconvenienced.	Inefficient from a farm management perspective and so there is a high risk it may not be followed at all times.
No cost to the Council and no separate agreement apart from the Stock Crossing Permit	Higher enforcement requirement from Council staff.
	This is a lesser option than what the farmer is offering.

Option 3 – Require the farmer to construct a cattle underpass.

Advantages	**Disadvantages**
Separates cow movement from road users so no impact on road users.	Unnecessarily expensive and because of low traffic volumes there would be no Waka Kotahi or Council contribution.
	Council could not compel the farmer to install an underpass.

Option 4 – Do nothing.

Advantages	**Disadvantages**
Current method works satisfactorily most of the time.	Does not improve the current situation.
	Current risk of cows escaping would remain.
	Current occasional inconvenience to motorists would remain.
	Would not take advantage of the current offer being made by the farmer.

4.3. The Management Team has reviewed this report and supports the recommendations.

Implications for Community Wellbeing

There are not implications on community wellbeing by the issues and options that are the subject matter of this report.

4.4. The Management Team has reviewed this report and support the recommendations.

5. COMMUNITY VIEWS

5.1. Mana whenua

Te Ngāi Tūāhuriri hapū are not likely to be affected by, or have an interest in the subject matter of this report.

5.2. Groups and Organisations

There are not groups and organisations likely to be affected by, or to have an interest in the subject matter of this report.

5.3. Wider Community

The wider community is not likely to be affected by, or to have an interest in the subject matter of this report.

6. OTHER IMPLICATIONS AND RISK MANAGEMENT

6.1. Financial Implications

There are not financial implications of the decisions sought by this report. The landowner will be required to cover all costs associated with the installation, maintenance and removal of all infrastructure associated with the proposed cattle stops.

6.2. Sustainability and Climate Change Impacts

The recommendations in this report do not have sustainability and/or climate change impacts.

6.3 Risk Management

There are risks arising from the adoption/implementation of the recommendations in this report

There is a risk the property owner will not properly maintain the cattle stops, fences and gates and the will become a Council liability. This is unlikely as Carleton Dairies is an established property owner in the area and it is in their best interest to keep the infrastructure in good condition. Also regular monitoring will identify any issues at an early stage and will allow action to be taken.

6.4 Health and Safety

There are health and safety risks arising from the adoption/implementation of the recommendations in this report.

There is a risk that drivers of vehicles may not see the cows and could hit them. It is noted that this risk exists now with the current method and the proposed method improves on the current situation by providing appropriate signage. Also the cattle stops and fences will provide a definite road narrowing and visual clues to the motorist of a change in road environment and a reason to take care. In addition visibility is very good.

It is also noted that the farmer has responsibilities under the Health and Safety in the Workplace Act in regard to his operations so he will need to have procedures in place in his farm operations health and safety management plan for managing this crossing.

The property owner and their contractor will be required to submit a Site Specific Health & Safety Plan for approval, prior to work commencing on site. This will include a temporary traffic management plan.

7. CONTEXT

7.1. Consistency with Policy

This matter is not a matter of significance in terms of the Council's Significance and Engagement Policy.

7.2. Authorising Legislation

The Local Government Ave 1974 Section 344, is the relevant legislation in this matter.

7.3. Consistency with Community Outcomes

The Council's community outcomes are relevant to the actions arising from recommendations in this report.

There is a safe environment for all

- Harm to people from natural and man-made hazards is minimised.
- Our district has the capacity and resilience to quickly recover from natural disasters and adapt to the effects of climate change.
- Crime, injury and harm from road crashes, gambling, and alcohol abuse are minimised.

Transport is accessible, convenient, reliable and sustainable

- The standard of our District's roads is keeping pace with increasing traffic numbers.
- Communities in our District are well linked with each other and Christchurch is readily accessible by a range of transport modes.

7.4. Authorising Delegations

The Board has the authority to approve this type of work within the Road Reserve.

WAIMAKARIRI DISTRICT COUNCIL

LICENCE TO OCCUPY ROAD

THIS IS AN AGREEMENT made on the …….…. day of ……..…… 2022

BETWEEN **THE WAIMAKARIRI DISTRICT COUNCIL** ("the Council")

AND **CARLETON DAIRIES LIMITED, C/- Julie Wells** ("the Licensee")

IN CONSIDERATION of the conditions and covenants contained in, or implied by, this document and in return for the licensee's observation and performance of these conditions and covenants.

THE COUNCIL HEREBY GRANTS to the licensee -

(a) the right to construct two cattle stops and associated fences, gates and sealing of the road, within the road reserve on that area shown in the attached map, being legal road – Carleton Road, adjacent to 1447 Carleton Road, in the position and according to the specification shown on the attached map for the purpose of allowing for the efficient regular movement of cows across the road.

(b) the right to occupy the land until this right is terminated under any of the provisions of this agreement.

THE LICENSEE HEREBY COVENANTS with the Council as follows:

1. That the design and construction of the cattle stops, fences, gates and sealing of the road shall be carried out to the satisfaction of the Manager – Utilities and Roading or his/her representative.

2. That the Licensee will properly indemnify the Council from and against all costs, actions, demands, suits, damages and proceedings of any kind for and in respect of any loss or damage that may directly or indirectly be caused to or be suffered by any person or property by reason of the gross negligence of any act carried out by the licensee.

3. That the Licensee will during the continuance of this licence keep the cattle stops, fences and gates in good order and condition as may be reasonably required.

AND IT IS HEREBY AGREED BY AND BETWEEN THE PARTIES AS FOLLOWS:

4. That no vested right shall be created and this licence is transferable only with the Council's written consent and upon payment of the fee applicable at that time.

5. (a) The term of this licence shall be for the operating life of the cattle stops, fences and gates or any replacement.

   (b) In the event the Council may require any portion of the equipment to be removed and/or realigned then it shall give the licensee reasonable notice of its intentions and the requirements that are associated with the proposed removal and/or realignment.

(c) All costs relating to the proposed removal and/or realignment are to be the responsibility of the Licensee.

6. That termination of the licence on grounds of gross negligence of any act by the licensee or on the licensee's behalf may be by way of the Council giving notice to the licensee who shall immediately remove the equipment and leave the roadway in good order and condition to the satisfaction of the Manager – Utilities and Roading

7. That the costs of any work required by the Council to remedy any failure by the licensee to comply with these provisions may be recovered by the Council as a debt.

8. That the licensee shall not be entitled to any compensation on the withdrawal or termination of this licence.

9. That nothing in this licence shall be construed to derogate from the rights of the Crown, the Council, or any local authority to enter upon the land for the purpose of installing, maintaining, repairing or removing any new or existing service over, under or on the land or for any other lawful purpose, providing that the installation of any services by the Crown, the Council or any other local authority shall not interfere with the cattle stops, fences and gates.

10. That when any notice is to be given it shall be sufficient in cases where the notice is to be given by the Council that the notice be signed by some person acting under the Council's express or implied authority and sent by post addressed to the licensee at the licensee's legal address.

11. The Licensee shall maintain and advise the Council of any changes to the existing layout of the cattle stops, fences and gates and provide the Council with the appropriate plans.

12. **Special Conditions**

(a) The Licensee pays one off administration fee of $200 +GST.

(b) A Traffic Management Plan must be used by the Contractor undertaking the work and submitted to Council for approval prior to work commencing.

(c) Gates must be erected on both sides of the cattle stops for pedestrian and horse rider access. Approved mounting blocks to be installed on both sides for use by horse riders.

(d) The Road Reserve must be left to high standard after the completion of work. If any gorse or noxious weeds appear due to the work undertaken, it will be the responsibility of the Licensee to eradicate.

(e) The Licensee shall install and maintain permanent traffic warning signs as directed by the Manager, Utilities and Roading on each approach to the cattle stops warning drivers of the possible presence of cows on the road.

(f) The Licensee shall keep the Council advised of any and all changes to the cattle stops, fences and gates.

(g) The Licensee shall construct and seal (chip seal or asphalt) the section of road between the cattle stops and no less than 10m on both approaches to the cattle stops to facilitate ongoing maintenance of the unsealed road network.

(h) The licensee shall be responsible for all repairs and maintenance of the cattle stops, fences and gates and any damage to the road or road reserve caused by the failure of the equipment or by any work on it.

(i) The licensee shall remove the cattle stops, fences and gates from the road reserve and reinstate the road and road reserve to its original condition if dairy farming operations cease resulting in the regular movement of cows across Woodstock Road no longer occurring.

(j) This licence is transferable and the cost of transfer is that published in the Council's Schedule of Fees and Charges applicable at time of transfer.

SIGNED by the
WAIMAKARIRI DISTRICT COUNCIL

acting under the delegated authority
of the Council
by affixing its common seal
in the presence of:

_____
Authorised Person

_____
Authorised Person

Signed by the Licensee
NAME

_____
Licensee

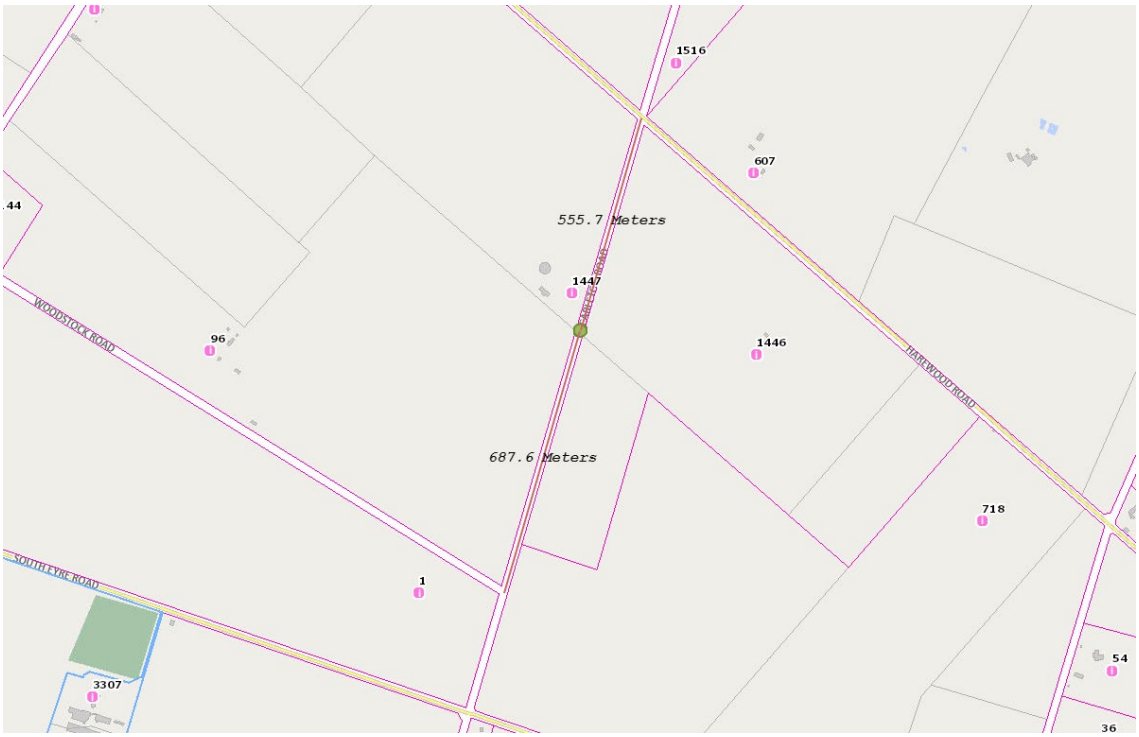
Witness for Licensee signature:

(Name) _____

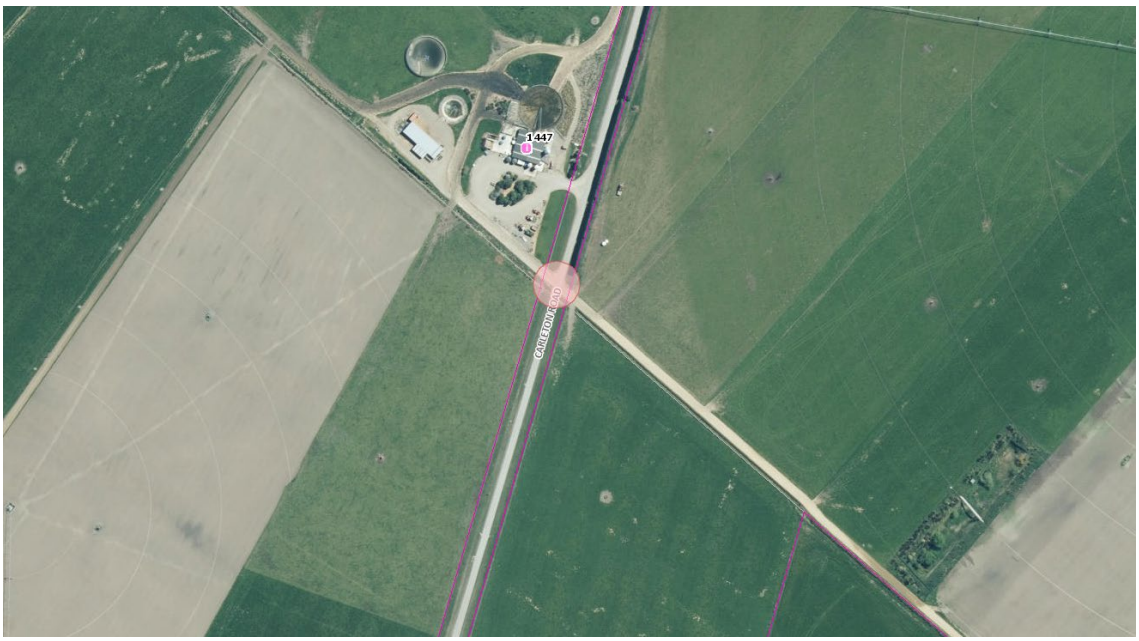
(Address) _____

_____

Location: Carleton Road, approximately 555m south of Harewood Road and 687m north of Woodstock Road.



At existing stock crossing location



Previous cattle stop installation on Woodstock Road

Previous cattle stop installation on Carelton Road (2021)

WAIMAKARIRI DISTRICT COUNCIL

REPORT FOR INFORMATION

FILE NO and TRIM NO:	DRA-06-10-01 / 220602094304
REPORT TO:	WOODEND-SEFTON COMMUNITY BOARD
DATE OF MEETING:	13 June 2022
AUTHOR(S):	Kalley Simpson, 3 Waters Manager
SUBJECT:	Waikuku Beach Drainage Investigations Update
ENDORSED BY: (for Reports to Council, Committees or Boards)	Department Manager / Chief Executive

1. SUMMARY

1.1. The purpose of this report is to update the Woodend-Sefton Community Board on progress with various drainage investigations underway in the Waikuku Beach area.

1.2. As a result of flooding in the May 2021, December 2021 and February 2022 storm events, eight areas were identified for further investigation in Waikuku Beach. The current status of these investigations and any proposed further work is summarised in the table below.

Investigation	Status
Waikuku Beach Campground	Breakout work complete. Environment Canterbury undertook emergency works to extend the lower reaches of the Ashley River stopbank through to the sand dunes. Note further work is underway looking the impacts of groundwater and localised flooding on the campground to assist with decision on the long term future of the campground.
Swindells Road	Maintenance works to clean pipes and culverts has been undertaken. The existing system has been identified to be inadequate and an options report is currently being prepared. Additional budget of $450,000 (comprising of $50,000 in 22/23 for design and $400,000 for construction in 23/24) has recently been approved by Council.
Kiwi Avenue Reserve / Broadway Avenue	The existing system has been identified to be inadequate and a proposed solution has been developed. Additional budget of $120,000 in 22/23 has recently been approved by Council.
Collins Drive	The installation of a secondary flap valve on the outlet into the Ashley River has been delayed, due to supply issues. The works have been awarded and the installation is proposed to be undertaken in July 2022.
Waikuku Beach Road	The installation of a high level flow culvert under Woodend Beach Road near Stokes Road has been discussed with the Roading & Transport Manager. The current proposed approach is to deploy flooding signs should overtopping occur at this location in the future.
Waikuku Beach Domain	Work on progressing this investigation has been delayed due to internal resourcing constraints. The assessment work has recently commenced. The output of this will be a recommendation to the Greenspace team.

Reserve Road / Broadway Avenue	Both these locations are serviced by a soakpit system that needs to be remediated. These works have been programmed to be undertaken by the Roading maintenance contractor.
Kiwi Avenue	

1.3. Further reports will be brought to the Woodend-Sefton Community Board for feedback on the proposed upgrading works in the Swindells Road and Broadway Avenue areas, prior to commencing construction works.

Attachments:

i. Waikuku Beach Drainage (TRIM 191216177546)
ii. Beach Flooding Community Meeting July 2021 (TRIM 210716117056)
iii. Flooding and Drainage Issues in Waikuku Beach (TRIM 220419059444)

2. RECOMMENDATION

THAT the Board:

(a) **Receives** Report No. 220602094304.

(b) **Notes** the following progress on the eight areas identified for further investigation in Waikuku Beach:

- Waikuku Beach Campground – Complete
- Swindells Road – Options assessment underway and funding approved
- Collins Drive – Works awarded
- Waikuku Beach Road – Investigation complete
- Kiwi Avenue Reserve / Broadway Avenue – Solution identified and funding approved
- Waikuku Beach Domain – Investigation recommenced
- Reserve Road / Broadway Avenue – Remedial works proposed
- Kiwi Avenue – Remedial works proposed

(c) **Notes** that further reports will be brought to the Woodend-Sefton Community Board for feedback on the proposed upgrading works in the Swindells Road and Broadway Avenue areas in the future.

(d) **Circulates** this report to the Utilities and Roading Committee for their information.

3. BACKGROUND

3.1. Waikuku Beach is located in a low lying coastal area that can experience high groundwater levels. The village is protected from fluvial flooding by the Ashley River stop bank system. The Taranaki Stream and Waikuku Stream, which serve large upstream catchments, discharge into the Ashley River in the vicinity of the Waikuku Beach village.

3.2. The existing drainage systems predominantly comprise of basic roadside swales, sumps & soakpits and piped outfalls which discharge either to local drains connected to the Taranaki Stream or directly to the Ashley River. Drainage in Waikuku Beach is challenging when ground water levels are high and when tailwater levels in the Taranaki Stream and/or Ashley River are high.

February 2018 Event (Cyclone Gita)

3.3. Widespread flooding was experienced across Waikuku Beach and the wider district in the February 2018 storm event. As a result a number of drainage maintenance and investigation works were undertaken (refer Attachment i). A permanent solution for the Kings Avenue issue has since been implemented, however the Waikuku Beach Domain work remaining outstanding.

May 2021 Event

3.4. Following the May 2021 flood event a public meeting was held and a presentation given by staff (refer Attachment ii). The following areas were identified for further investigation work:

- Waikuku Beach Campground
- Swindells Road
- Collins Drive
- Waikuku Beach Road
- Kiwi Avenue Reserve
- Waikuku Beach Domain

December 2021 and February 2022 Events

3.5. Flooding was subsequently experienced at the following locations as a result of the December 2021 flood event and/or the February 2022 flood event, which required investigation work (refer Attachment iii).

- Swindells Road
- Kiwi Avenue Reserve / Broadway Avenue
- Reserve Road / Broadway Avenue
- Kiwi Avenue

3.6. A Flood Team has been formed to look into all the flooding issues in the district after the May 2021, December 2021 and February 2022 major rain events. A total of approximately 600 service requests were received during those events, of which 27 related to issues experienced in Waikuku Beach.

4. ISSUES AND OPTIONS

4.1. This section provides an update on each of the eight areas identified for further investigation in Waikuku Beach, as a result of flooding in the May 2021, December 2021 and February 2022 storm events.

Waikuku Beach Campground

4.2. Flooding of the Waikuku Beach Campground occurred in the May 2021 storm event as a result of the Ashley River breaching the lower part of the stopbank (refer Attachment i).

4.3. Environment Canterbury have undertaken emergency works to extend the lower reaches of the Ashley River stopbank through to the sand dunes. This work was completed in August 2021. A photograph of the completed works in shown in Figure 1 and Figure 2 below.

Figure 1 – Photograph of stopbank extension where flow occurred in the May 2021 event

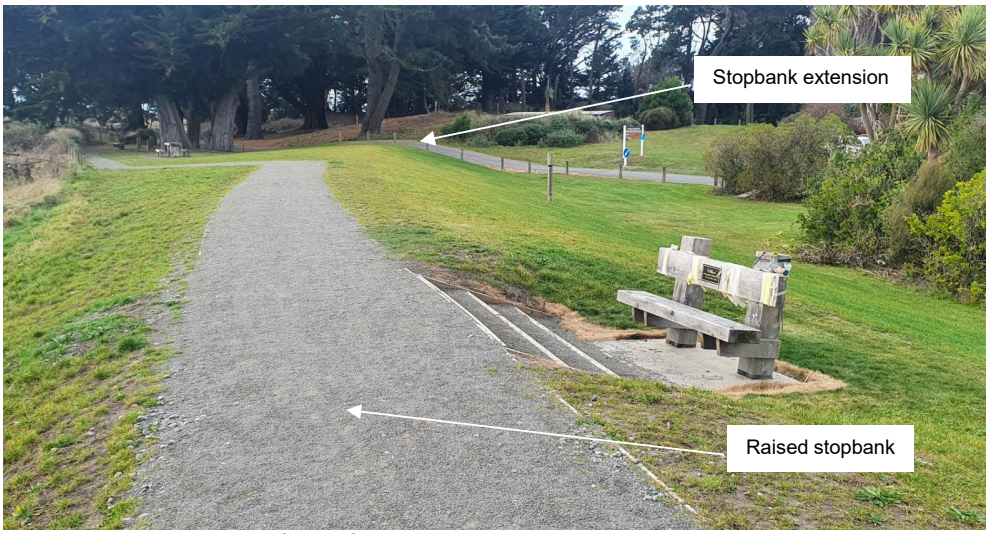


Figure 2 – Photograph of modified stopbank at the Ashley-Rakahuri River Mouth reserve entrance

4.4. Note further work is underway looking the impacts of groundwater and localised flooding on the campground to assist with decision on the long term future of the campground.

Swindells Road

4.5. Flooding in Swindells Road has been experienced in the May 2021, December 2021 and February 2022 storm events. It is noted that flooding was also previously experienced during the February 2018 event and maintenance works was undertaken in April 2019 to improve flow through the swales and driveway culverts (refer Attachment i).

4.6. Since the most recent events, maintenance works to clean pipes in Park Terrace and driveway culverts in Swindells Road has been undertaken. This has included jetting and CCTV inspection of approximately 300m of pipework as shown in Figure 3 below.

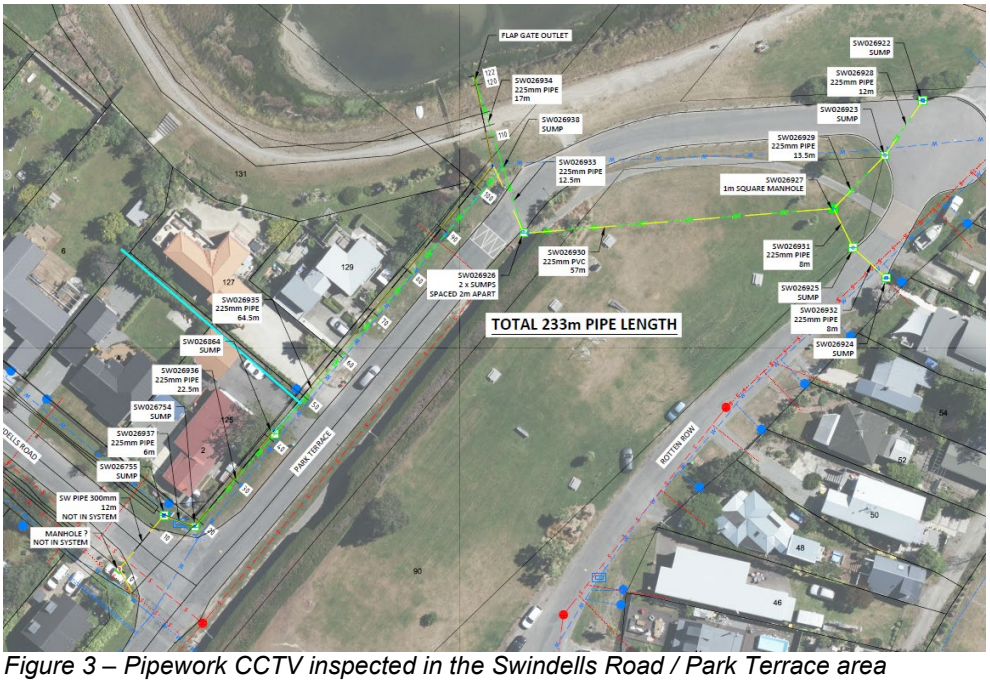


Figure 3 – Pipework CCTV inspected in the Swindells Road / Park Terrace area

4.7. An options assessment is currently underway looking at short term through to long term options to improve the drainage at this location. The potential options include:

- Localised upgrades of driveway culverts, pipes and swale to provide a functional improvement to the existing system (expected 2 year capacity).
- System wide upgrades and extension to provide a 5 year level of service capacity in the primary system.
- Provision of pump chamber to enable efficient and effective deployment of a temporary pump.
- Installation of a permanent pump station.
- Use of the adjacent reserve to provide a stormwater retention basin.

4.8. The options assessment is yet to be finalised, however it is likely that the pipe through the stopbank will need to be replaced as it is in poor condition.

4.9. An additional budget of $450,000 was requested as part of the Drainage Staff Submission to the Draft 2022-23 Annual Plan (refer TRIM 220505071056). This included $50,000 in 2022/23 for design and $400,000 in 2023/24 for construction. This budget was approved by Council for inclusion in the final 2022-23 Annual Plan.

4.10. This budget will enable the system to be upgrade and extended along the toe of the stopbank, and also for a pump chamber to be installed for a temporary pump. The next steps are to finalise the options memo before seeking feedback on the proposed solution.

4.11. A further report will be brought to the Woodend-Sefton Community Board for feedback on the proposed upgrades in Swindells Road.

Kiwi Avenue Reserve / Broadway Avenue

4.12. Flooding in the Kiwi Avenue Reserve / Broadway Avenue area has been experienced in the May 2021 and December 2021 storm events. It is noted that flooding was also previously experienced during the February 2018 event and upgrading works were undertaken to improve the drainage at the western end of Kiwi Avenue (refer Attachment i). However the drainage issue at the north west corner of the reserve was not resolved by these work.

4.13. An options assessment has been completed for this issue. The recommended solution is to install new 300mm pipe from the low point in the reserve through to the Park Terrace drain (refer Figure 4 below). Shallow bunding is also proposed along the western and northern boundaries of the Kiwi Avenue reserve.

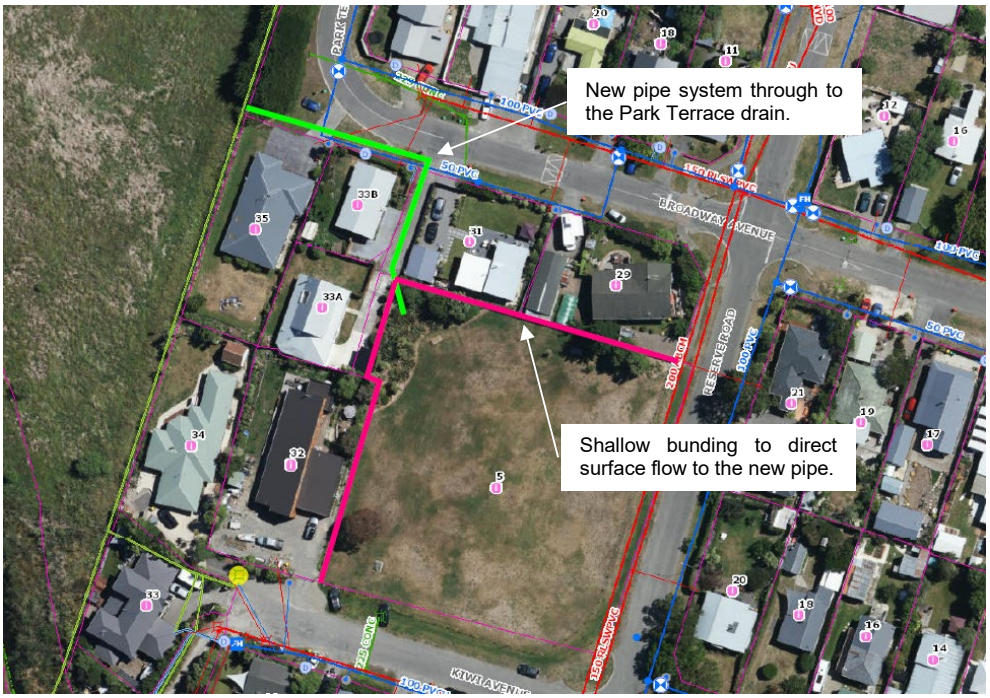


Figure 4 – Pipework CCTV inspected in the Swindells Road / Park Terrace area

4.14. An additional budget of $120,000 was requested as part of the Drainage Staff Submission to the Draft 2022-23 Annual Plan (refer TRIM 220505071056). This included the full $120,000 in 2022/23 for design and construction. This budget was approved by Council for inclusion in the final 2022-23 Annual Plan.

4.15. Initial consultation has commenced with the directly affected property owners to obtain their views of the proposed solution. This identified other issues with the drainage at the Reserve Road / Broadway Avenue intersection that will need to be improved. Additionally the investigation work undertaken identified an undersized pipe on the existing system at the Park Terrace / Broadway Avenue intersection that will need to be improved.

4.16. A further report will be brought to the Woodend-Sefton Community Board for feedback on the proposed upgrades in the Kiwi Avenue Reserve / Broadway Avenue area in the near future.

Collins Drive

4.17. Flooding occurred in Collins Drive during the May 2021 storm event as a result of backflow from the Ashley River bypassing the existing flapgate (refer Attachment i). Maintenance works have been undertaken to improve the operation of the existing flapgate, which is owned by Environment Canterbury. However a secondary flapgate is considered necessary to prevent backflow if the existing flapgate fails in the future.

4.18. It is proposed to install a Wastop valve in the upstream manhole in Collins Drive (refer Figure 5 below).

Figure 5 – Location of proposed Wastop valve in Collins Drive

4.19. A non-standard Wastop is required as the valve will be installed on the upstream end of the outlet pipe, rather than the downstream end at the outlet as per typical installation. There has been a longer lead time to supply the Wastop required than originally expected. The works have been awarded and the installation works will be undertaken in July 2022. This will require the manhole to be partially deconstructed to install the valve.

Waikuku Beach Road

4.20. Flooding occurred over Waikuku Beach Road, just to the west of Stokes Road, during the May 2021 storm event as a result of flow from the Waikuku Stream backing up behind the Leggitts Road outlet and filling the farmland behind the stopbank (refer Attachment i).

4.21. The flooding depth was less than 100mm so was passible to traffic at low speeds. The Council's localised flood hazard maps indicate that flood depths could reach up to 280mm in a 100 year flood event, which would still be passible to four-wheel drive vehicles (refer Figure 6 below).

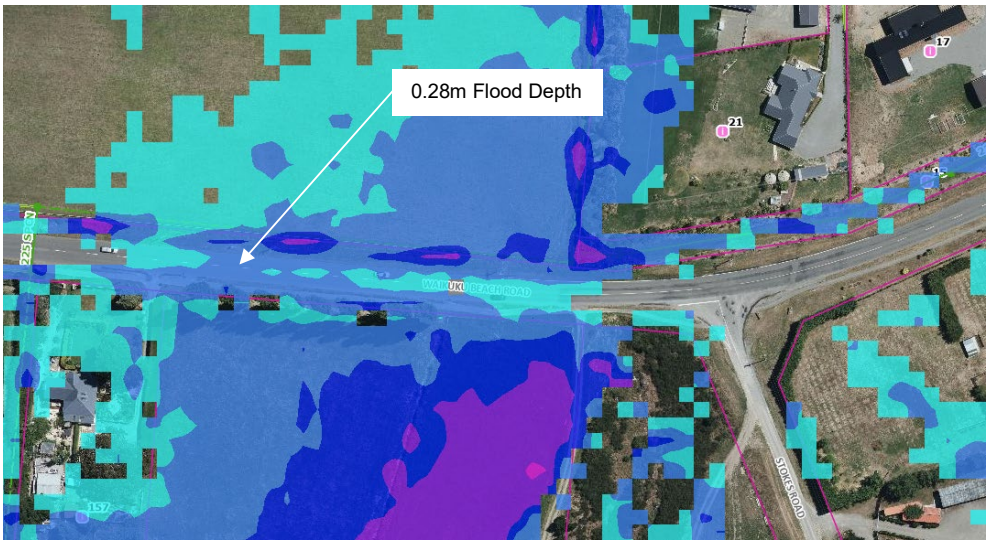


Figure 6 – Location of deepest spill point over Waikuku Beach Road

4.22. The installation of a high level flow culvert under Woodend Beach Road near Stokes Road has been discussed with the Roading & Transport Manager. The current proposed approach is to deploy flooding signs should overtopping occur at this location in the future.

Waikuku Beach Domain

4.23. An area of the Waikuku Beach Domain near the flying fox can experience ponded water for an extended period of time following significant rainfall events. The ponded water is stagnant with no outlet and can produce odour issues in the summer. This issue was experienced following the February 2018 and May 2021 events (refer Attachment i), however has not been as problematic following the more recent December 2021 and February 2022 events. The current condition of the area is shown in Figure 7 below.

Figure 7 – Area prone to ponding adjacent to the flying fox in the Waikuku Beach Domain

4.24. Work on progressing this investigation has been delayed due to internal resourcing constraints. The assessment work has recently recommenced and will cover an assessment of the following options:

- Filling of the low areas
- Installing subsoil drainage
- Converting area to a permanent wetland
- Creating a bund around the western side
- Installing a pipe to drain the low area

4.25. The output of this assessment will be a recommendation to the Greenspace team for their consideration.

Reserve Road / Broadway Avenue & Kiwi Avenue

4.26. Flooding of two low lying garages, one in Broadway Avenue (just off Reserve Road) and one in Kiwi Avenue (refer Figure 8 below), have occurred in December 2021 and February 2022 events. Both these areas are serviced by two soak pits and there is no piped drainage system in this area (apart from the pipe under the road linking the two soakpits). The ground east of Reserve Road is lower than surrounding area so there is no defined secondary flow path.

Figure 8 – Location of flooding at the low points in Reserve Road/Broadway Avenue and Kiwi Avenue

4.27. Jetting and CCTV inspection of the pipes has been undertaken and a topographical survey has been completed. The soakpits need to be fully remediated to ensure they are functioning as intended. This work has been issued to the Roading maintenance contractor and is programmed to be undertaken in the next month.

Implications for Community Wellbeing

Some of the locations of flooding have had flooding in the past and some residents have had to make insurance claims for flood related damage. This has a potential implication on community wellbeing for these residents.

4.28. The Management Team has reviewed this report and support the recommendations.

5. COMMUNITY VIEWS

5.1. Mana whenua

Te Ngāi Tūāhuriri hapū are not likely to be directly affected by the investigation work, however they will have an interest in any future proposed works that may have an impact on waterways and rivers. Staff will update the Runanga at the executive meetings and where relevant on specific projects engage with Mahaanui Kurataiao (MKT).

At this stage it is expected that the Swindells Road Drainage Upgrade will be able to be carried out under existing consents. However, as this is a direct discharge to the Ashley River, we will specifically seek input from the Runanga via MKT on project design and construction aspects. All the other projects are effectively work on the existing network.

5.2. Groups and Organisations

Directly affected property owners will be consulted with on the proposed upgrades.

There are not groups and organisations likely to be affected by, or to have an interest in the subject matter of this report.

5.3. Wider Community

The wider community will be kept informed via the Council's website. A dedicated webpage has been set up for the recent flood events across the wider district, refer:

https://www.waimakariri.govt.nz/services/water-services/stormwater/drainage-works

A community meeting was held for Waikuku Beach residents on 6 July 2021, however not all investigation work has been yet to be completed. If necessary, a targeted update to the Waikuku Beach community, either via a local newsletter flyer or dedicated flyer will be delivered to all addresses in the village.

6. OTHER IMPLICATIONS AND RISK MANAGEMENT

6.1. Financial Implications

There are not financial implications of the decisions sought by this report.

The following budgets were recently approved by Council for inclusion in the final 2022-23 Annual Plan (refer TRIM 220505071056):

- Broadway Ave Drainage Upgrade – $120,000 (in 2022/23)
- Swindells Road Drainage Upgrade – $450,000 (comprising of $50,000 in 2022/23 for design and $400,000 in 2023/24 for construction).

All other investigation and maintenance works is being undertaken from existing operational budgets.

6.2. Sustainability and Climate Change Impacts

The recommendations in this report do not directly have sustainability and/or climate change impacts.

Any proposed upgrading works will consider the potential impacts of climate change in terms of higher rainfall intensities and sea level rise. The procurement of any physical works will use sustainable procurement practices.

6.3 Risk Management

There are no additional risks arising from the adoption/implementation of the recommendations in this report. The improvements implemented as a result of the drainage assessment identified will reduce the overall risk profile to Council and the community.

6.3 Health and Safety

The health and safety risks associated with undertaking this investigation work and with the development of proposed solutions will be managed by following standard Council processes.

Any contractors undertaking condition assessment or physical works contracts will be required to be SiteWise registered and meet minimum score requirements appropriate for the risk of the work being undertaken.

7. CONTEXT

7.1. Consistency with Policy

This matter is not a matter of significance in terms of the Council's Significance and Engagement Policy.

7.2. **Authorising Legislation**

The Local Government Act 2002 sets out the power and responsibility of local authorities, including the Council's role in providing drainage services.

7.3. **Consistency with Community Outcomes**

The Council's community outcomes listed below are relevant to the actions arising from recommendations in this report.

- *There is a safe environment for all*
- *Core utility services are provided in a timely and sustainable manner*

7.4. **Authorising Delegations**

The Woodend-Sefton Community Board has delegation to receive this report as it relates to issues affecting the ward area.

WAIMAKARIRI DISTRICT COUNCIL

MEMO

FILE NO AND TRIM NO:	DRA-06-10-01 / 191216177546
DATE:	19th December 2019
MEMO TO:	Owen Davies, Drainage Asset Manager; Kalley Simpson, 3 Waters Manager
FROM:	Victoria Clark, Consultant Engineer
SUBJECT:	Waikuku Beach Drainage

1. Introduction

The purpose of this memo is to:

- Summarise the drainage works undertaken in Waikuku Beach since July 2018
- Note the drainage issues in Waikuku Beach which have not yet been addressed and provide high level options for potential future improvements.

The areas covered in this memo where drainage issues were identified include:

- Swindells Road
- Reserve Road
- Broadway Avenue
- Reserve Road / Kiwi Avenue Park
- Rotten Row Reserve
- Kings Avenue / Allin Drive (drain through private property and Kings Avenue culverts)
- Allin Drive
- Kings Avenue sump
- Taranaki Stream flood gate.

2. Investigations and work completed

WDC have undertaken a number of drainage maintenance and investigative activities within Waikuku Beach since July 2018. It was noted a significant amount of the drainage infrastructure in the area was not recorded in GIS and RAMM. These have since been updated. The works undertaken in each area are summarised below.

Figure 1 summarises the works undertaken and the drainage issues still to address.

Swindells Road

The existing culverts and swales on Swindells Road have been cleaned by Sicon (April 2019).

Rotten Row Reserve

Surface ponding in Rotten Row reserve prompted (in September 2018):

- Clearing of the culverts on the east side on Rotten Row by Sicon
- Inspection of the soak pit in the south east corner of the reserve. The soak pits were found to be clear and functioning effectively.

Further monitoring of the ponding in the reserve is required. Refer to section 3.

Figure 1. Waikuku Beach maintenance and investigations undertaken since July 2018. Red items are completed works / investigations and blue items are ongoing issues.

Reserve Road

Flooding on Reserve Road has been an ongoing issue, in particular at the northern end of the road and at the intersection with Broadway Avenue. The following activities have been undertaken (in August 2018):

- Documentation of the existing drainage infrastructure
- Clearing of the swales and culverts
- Inspection of the soak pits.

Soak pits were identified at the intersections of Reserve Road with Cross Street and with Broadway Avenue. The soak pits were found to be clear and functioning effectively. The reason for lack of drainage ability was assessed to be that groundwater levels are high, meaning, particularly at high tide, the soak pits are unable to drain. At low tide when the groundwater level drops, the water is able to drain away.

At the northern end of Reserve Road in the western berm a water main was exposed (Figure 2). The WDC Water Unit lowered the water main, but in the process disrupted the drainage from Reserve Road to the lagoon by removing a section of the outlet pipe and burying the pipe inlet. The WDC Roading team are currently in the process of locating the outlet of the pipe and will reinstate as required.

The Roading team are also currently working on an issue at 15 Reserve Road. The level of the property is low. Consequently, stormwater from the road flows into the property. Roading have recently installed a new sump on the Reserve Road footpath with a pipe connection discharging to an existing sump (which then discharges to a soak pit), refer to Figure 3. The impact of this work should be monitored.

Figure 2. Reserve Road water main and drainage outlet to lagoon.

Figure 3. New sump and pipe recently installed by Roading at the intersection of Cross Street and Reserve Road.

Broadway Avenue

The existing swales and culverts on Broadway Avenue have been cleaned out by Sicon (in August 2018).

Park Terrace Drain

The existing drain, parallel to Park Terrace, was cleaned by Sicon (in July 2018).

Reserve Road / Kiwi Avenue Reserve

There have been several service requests (DR1800031, DR1800042, DR1800239) relating to water ponding on the reserve at the corner of Kiwi Avenue and Reserve Road. It is understood in large rain events the water flows across the reserve to the properties to the northwest.

Old drainage plans show an existing sump at the northwest corner of the reserve, connecting to a pipe, with two further sumps within 35 Broadway Avenue, discharging to the Park Terrace drain. The sumps within 35 Broadway Avenue were located on site, however the sump within the reserve could not be located.

CCTV was attempted (October 2018) to confirm the location and condition of the pipes and sumps. It was found there is a soak pit at the end of the pipe in 35 Broadway Avenue and it does not extend to the reserve (Figure 4). These pipes are not shown in WaiMaps.

Figure 4. 35 Broadway Avenue stormwater pipes.

Figure 5. Kiwi Avenue drainage works.

At the southwest corner of the reserve, on Kiwi Avenue, the Roading team have recently installed a new sump and pipe connection to an existing sump, which discharges west into the Park Terrace drain (Figure 5). This is to address the issue of ponding water along the southern end of the reserve. The impact of this work should be monitored, and further work investigated. In particular the northeast of the reserve should be monitored, and options investigated if drainage issues persist.

Kings Avenue / Allin Drive
The existing culverts and the drain through private property from Kings Avenue to Allin Drive were cleaned by Sicon (July 2018). Similarly, existing swales and culverts on both Kings Avenue and Allin Drive were cleaned (July 2018).

Kings Avenue Sump
An existing sump outside the 37 / 39 Kings Avenue boundary is currently not draining water away in rain events, and consequently flooding of the road which extends into the neighbouring properties has been observed.

Investigations identified this sump is the upstream sump of a bubble-up system across Kings Avenue. The downstream sump was located and exposed (Figure 6). The sumps and pipe were cleaned out (August 2019) and are now functioning.

Figure 6. Kings Avenue downstream bubble-up sump opposite 37 / 39 Kings Avenue.

Figure 7. Kings Avenue downstream bubble-up sump opposite 37 / 39 Kings Avenue, and drainage path to the north behind the water pump station.

Currently from the bubble-up sump the water continues overland behind the Waikuku Beach Water Treatment Plant and pump station (Figure 7). This poses a risk of erosion and damage to the Council building. Permanent options to mitigate the flood risk and formalise the discharge from the bubble-up sump were identified. A permanent solution is yet to be implemented. Refer to 'Kings Avenue Culvert, Waikuku Beach' August 2019 memo (TRIM 190826119217) for further information.

Taranaki Stream flood gate

Liaison between WDC and Environment Canterbury (ECan) suggests that the Taranaki Stream tide gate is not operating optimally. This is likely to be contributing to the high-water level in the Taranaki Stream and its tributaries around Waikuku Beach.

To address this ECan have undertaken maintenance work on the Taranaki Stream and dredging of the channel downstream of the flood gate. The work has improved drainage behind the stopbank and had a noticeable effect on water levels in the Taranaki Stream.

Further work is planned by ECan to the flood gate itself to replace the seals. As a temporary measure, to help reduce water levels upstream, ECan staff have been manually operating the gate to allow the maximum volume of water to pass through.

3. Ongoing drainage issues

The known drainage issues in Waikuku Beach which have not yet fully been addressed include:

- Rotten Row Reserve surface ponding
- Waikuku Beach Domain surface ponding.

It is recommended that flooding at these locations, and those where maintenance works have been undertaken, is monitored. If drainage issues persist further remedial solutions should be investigated and implemented.

Groundwater

High groundwater levels (tidally influenced) are a contributing factor to the drainage issues around Waikuku Beach. A groundwater monitoring well at 34 Queens Avenue (M35/0443) has a groundwater record with monthly data from 10th June 1968 to present (latest reading 4th October 2019), refer to Figure 8.

The data shows that since 1968 the groundwater level has generally risen, with particularly high levels measured over the last 20 years. The data demonstrates that increasingly the groundwater level is above ground level for periods each year.

The consequence of the high groundwater levels is that the period of time in which water is able to effectively drain from the area is reduced. This leads to water ponding on the surface for longer periods of time.

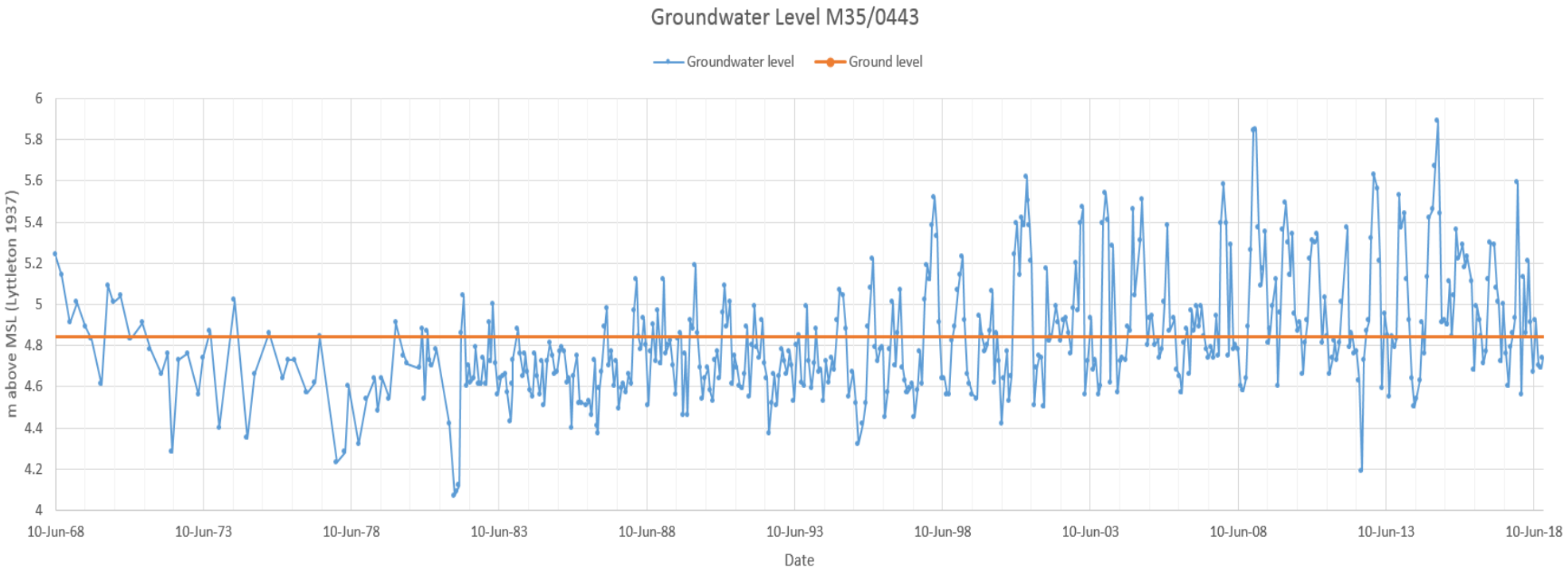


Figure 8. Groundwater data from M35/0443. The ground level measured at the location of the well (4.84 MSL) is shown by the orange line.

Domain

Flooding of the Waikuku Beach Domain between Bridge Street and Waikuku Beach Holiday Park has become an issue in recent years (Figure 9).

It is understood the cause of the domain flooding is a combination of the following:

- High groundwater
- Old land fill site – it is possible ground settlement has occurred
- Ground movement following the Kaikoura earthquake.

Figure 9. Waikuku Beach domain. The left image is from 2018 and shows the area of the domain (circled in red) which experiences regular flooding. The right image from 2014 shows the area without flooding.

If drainage issues in the domain persist remedial options could include:

- Filling of the low areas
- Installing subsoil drainage to discharge to the Taranaki Stream (to the west)
- Converting the area to a permanent wetland or pond
- Creating a bund around the western side of the low area to prevent water spilling from the Taranaki Stream to the west
- Installing a pipe to drain the low area to the Taranaki Stream (to the west)

Each of these potential options would need to be investigated to determine the feasibility and effectiveness. It is unlikely that one option alone will completely address the drainage issues in this area. It is recommended that the next step is to undertake topographical survey and a geotechnical assessment of the area prone to flooding.

Rotten Row reserve

No works have been undertaken to directly address the surface ponding within the Rotten Row reserve. As discussed in section 2 the soak pits have been inspected and confirmed to be in good condition. Due to the high groundwater levels in the area the soak pits are unable to drain away at high tide which is likely contributing to water ponding in the reserve. It is recommended any flooding in the reserve is monitored and if the issue continues further action may be required. This could include installing subsurface drainage along the western boundary of the reserve, or upgrading or installing new soak pits.

Reserve Road / Kiwi Avenue Reserve

Although investigation work has been undertaken to locate the existing stormwater infrastructure in the reserve, no work has been completed to directly address the surface water flowing across to the northwest of the reserve. The installation of the new sump in

the southwest corner of the reserve could positively effect this. It is recommended the impact of the new sump is monitored and further action may be required if the problem persists. This could include installation of subsurface drainage along the northern and western boundaries in the reserve, reinstating the pipeline through 33 Broadway Avenue, and / or installing a new soak pit in the northwest corner of the reserve.

4. Summary

Since July 2018 there have been a significant amount of drainage maintenance works undertaken in Waikuku Beach, including on Swindells Road, Reserve Road, Broadway Avenue, Kings Avenue and Allin Drive. It is expected these works will have a positive impact on the drainage capability of the area.

It is important to note however, that groundwater levels in Waikuku Beach are high and this consequently poses challenges with the ability of the area to drain effectively. It will not be possible to fully address drainage issues and flood risk in Waikuku Beach via gravity, however, the aim should be to minimise the impact to private property and users of the public spaces.

It is recommended that the recent maintenance activities are monitored, and future actions taken if flooding issues continue to adversely and regularly impact the public.

It is also recommended the following are progressed:

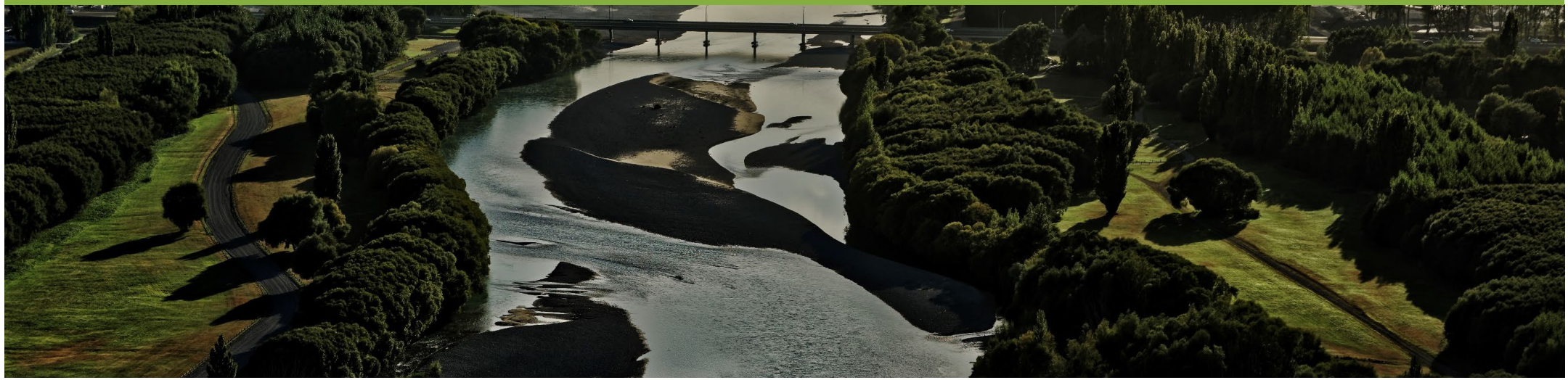
- Survey and geotechnical investigations at Waikuku Beach Domain
- A permanent solution implemented to mitigate the flood risk and formalisation of the discharge from the Kings Avenue bubble-up sump
- Annual maintenance of the culverts and swales in Waikuku Beach
- A ‘Monitoring Plan’ and recording register is prepared and assigned to staff for action including all sites / assets discussed within this memo and any existing monitoring / maintenance tasks in Waikuku Beach.

WAIMAKARIRI
DISTRICT COUNCIL

Waikuku Beach Flooding

Community Meeting
July 2021

Kalley Simpson, 3 Waters Manager



Agenda

- **Welcome – Gerard Cleary**
- **Background**
  - Drainage Context
- **Recent Flood Events**
  - February 2018 Event
  - May 2021 Event
- **Areas of Flooding**
  - Proposed Mitigation Works
- **Way Forward / Timeframe**
- **Questions and Feedback**

Background

Waikuku Beach – Drainage Context

- Low lying coastal area*
- High groundwater
- Large upstream catchments from rural and urban areas*
- Basic stormwater system roadside swales, soakpits, sumps and pipes
- Protected from fluvial flooding by the Ashley River stop bank system

Drainage is challenging in Waikuku Beach

Background – Historical Flooding

January 1953 Flood - Looking across the Ashley River at flooding between Waikuku Beach and Woodend Beach. Floodwaters extended through to the Pines and Kairaki. Photograph by L Ernle Clark for North Canterbury Catchment Board.

Recent Flood Events

February 2018 Event (Cyclone Gita)

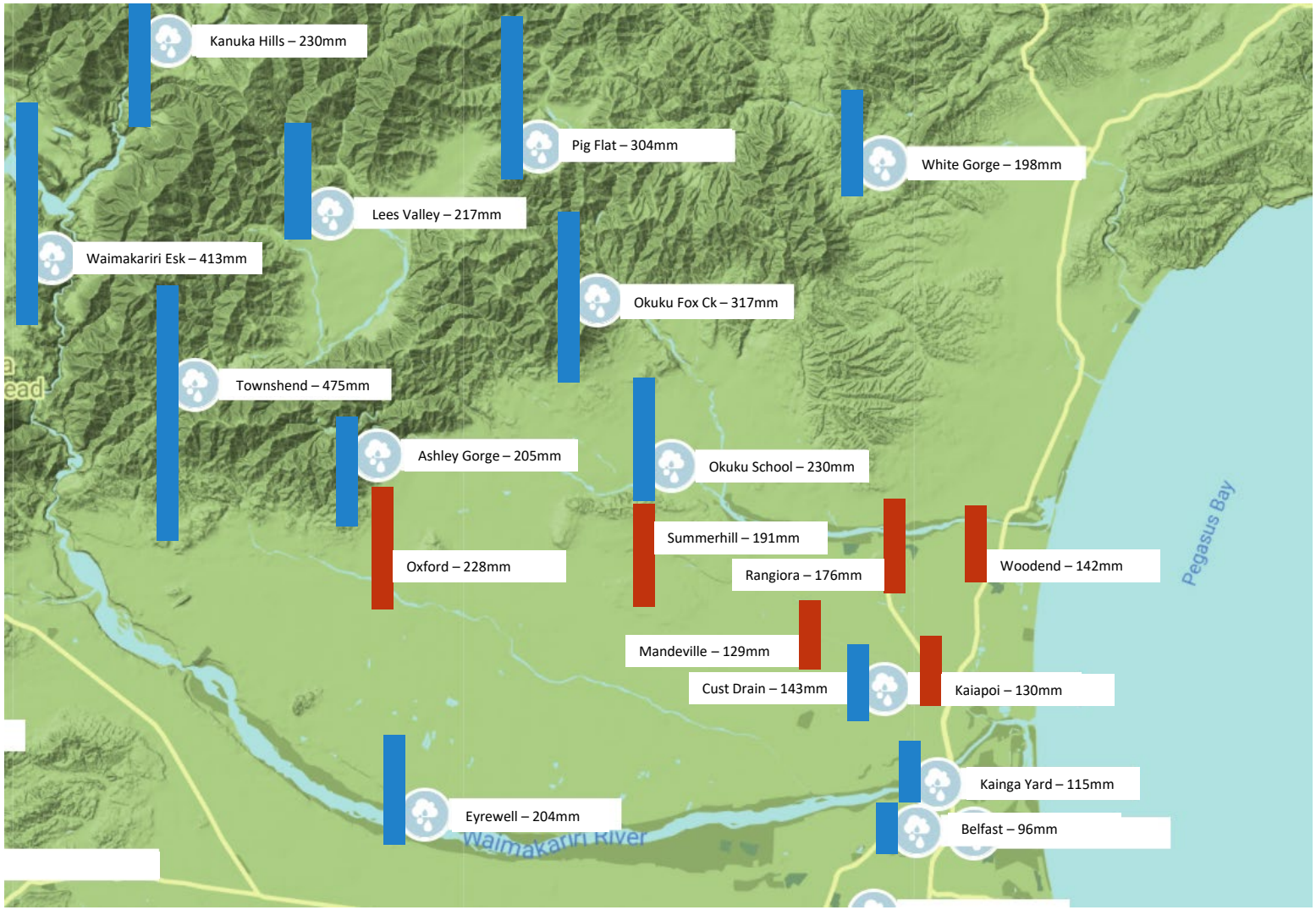
- Significant event:
  - 100mm in 12 hours
  - Groundwater levels already high
- Widespread flooding across Waikuku Beach and wider District
- Areas Investigated:
  - Swindells Road
  - Reserve Road
  - Broadway Avenue
  - Kiwi Avenue Reserve
  - Rotten Row Reserve
  - Waikuku Beach Domain
  - Kings Avenue / Allin Drive
  - Allin Drive
  - Kings Avenue sump
  - Taranaki Stream flood gate.


M35/0443
DRAIN CLEANED
QUEENS AVENUE
TARANAKI STREAM
DREDGING OF TARANAKI STREAM
SWALES AND CULVERTS CLEANED
SWINDELLS ROAD
SWALES AND CULVERTS CLEANED
KINGS AVENUE SUMP
ROTTEN ROW
FLOODING IN THE RESERVE
SWALES AND CULVERTS CLEANED
ALIGN DRIVE
KINGS AVENUE
PARK TERRACE
SOAK PIT INSPECTION - OK
DOMAIN TERRACE
DRAIN CLEANED
Northside Drive SMA
BRIDGE STREET
FLOODING IN THE DOMAIN
SOAK PIT INSPECTION - OK
WAIKUKU BEACH ROAD
DRAIN CLEANED
SWALES AND CULVERTS CLEANED
CROSS STREET
RESERVE ROAD
PIPES INVESTIGATED
BROADWAY AVENUE
FLOODING IN THE RESERVE
KIWI AVENUE
WAIKUKU BEACH
NEW SUMP AND PIPE

Recent Flood Events

May 2021 Event

- Long duration event:
  - 142mm over 48 hours
- Two main issues:
  1. Stormwater behind the stopbank not being able to get drain away.
  2. High river levels breaching or back flowing into the Localised flooding in Kaiapoi. No wastewater overflows.
- Main areas of flooding:
  - Waikuku Beach Campground
  - Swindells Road
  - Collins Drive
  - Waikuku Beach Road
  - Kiwi Avenue Reserve
  - Waikuku Beach Domain



Rainfall Depths

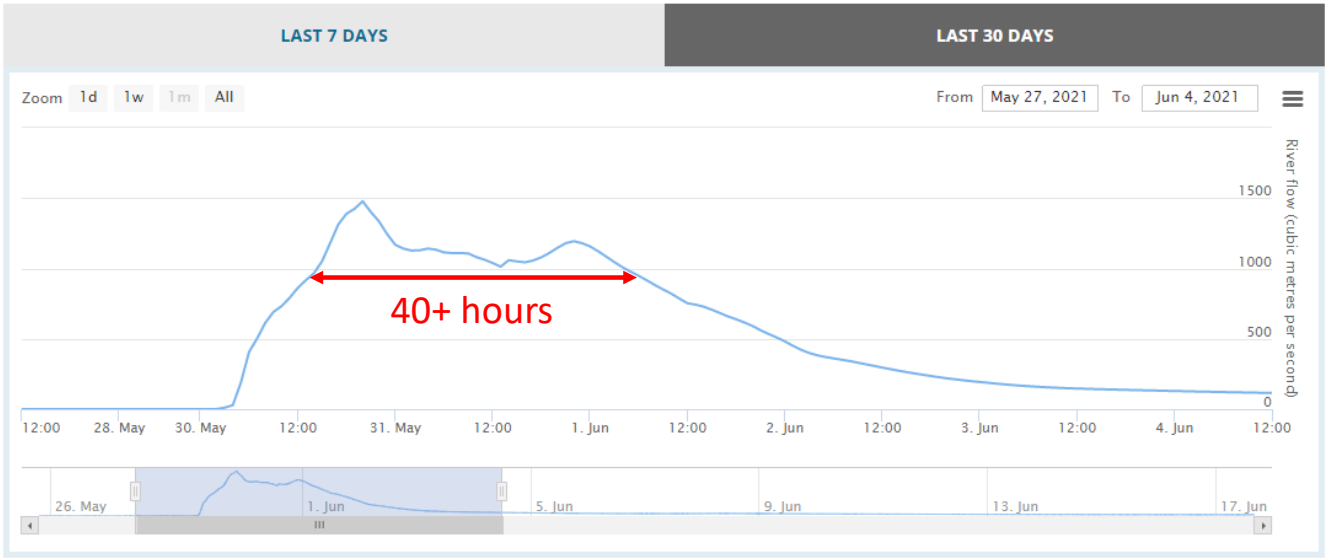
- Higher in hills compared to coast
- Higher in north compared to south
- Rivers more impacted than urban stormwater networks

River Levels

River Flow for Ashley River at RTB (Cones Rd)

LAST SAMPLE (NZD STD TIME)	STAGE M	FLOW M3/S	CHANGE MM/H	7 DAY PEAK STAGE	7 DAY PEAK FLOW	7 DAY PEAK DATE	TEMP CELSIUS
17-Jun 16:00	0.607	45.135	-1	0.738	72.01	10-Jun 00:10	

River flow (cubic metres per second)

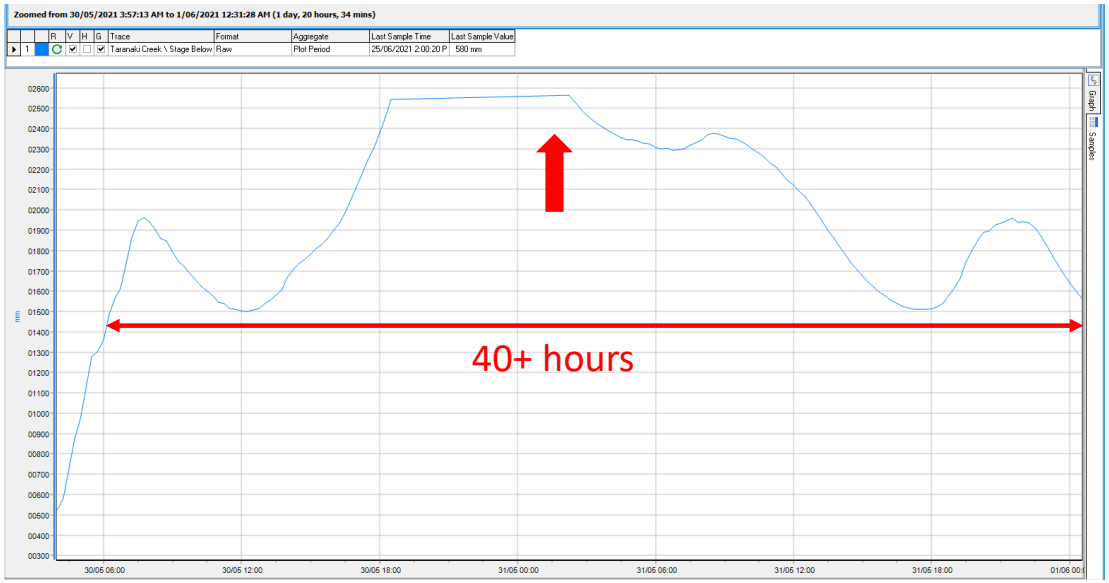


Back to Listing | Download data

Information provided by Environment Canterbury Regional Council Kaunihera Taiao ki Waitaha

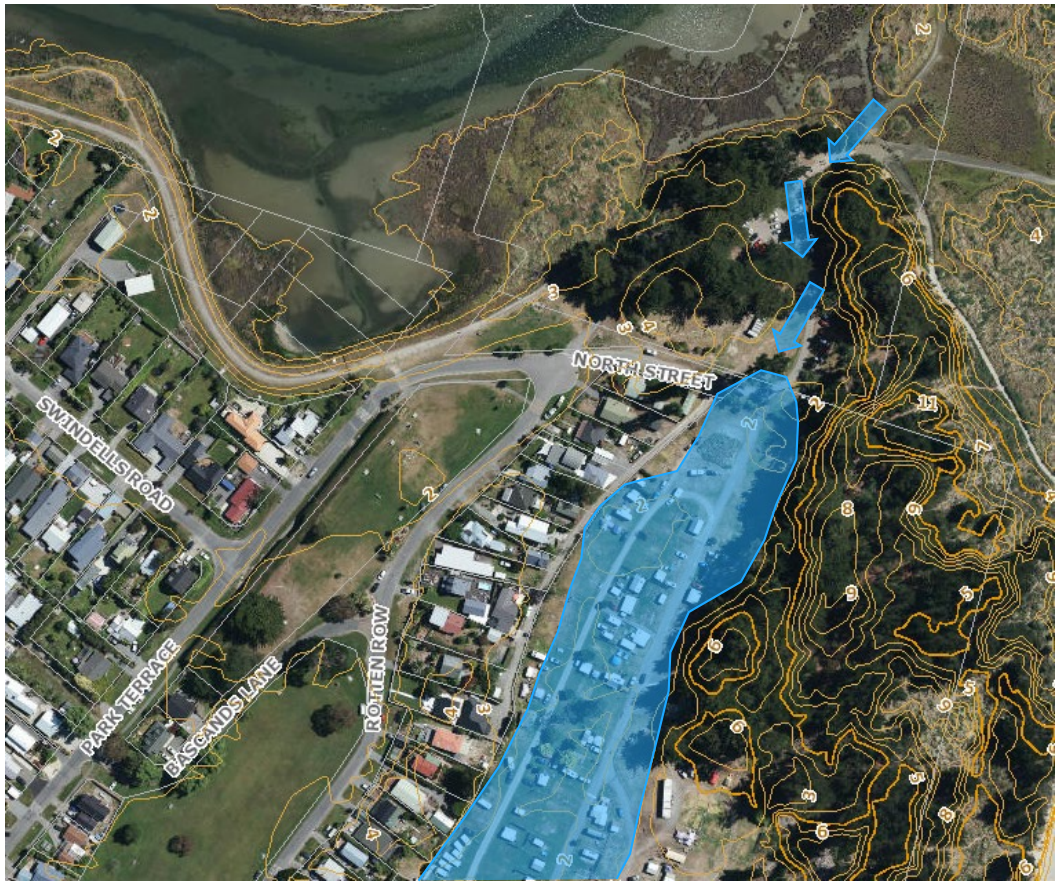
Sand Spit / Bar Breach

- Breach sometime between 1am and 7am
- Potentially at about 2:30am at low tide?

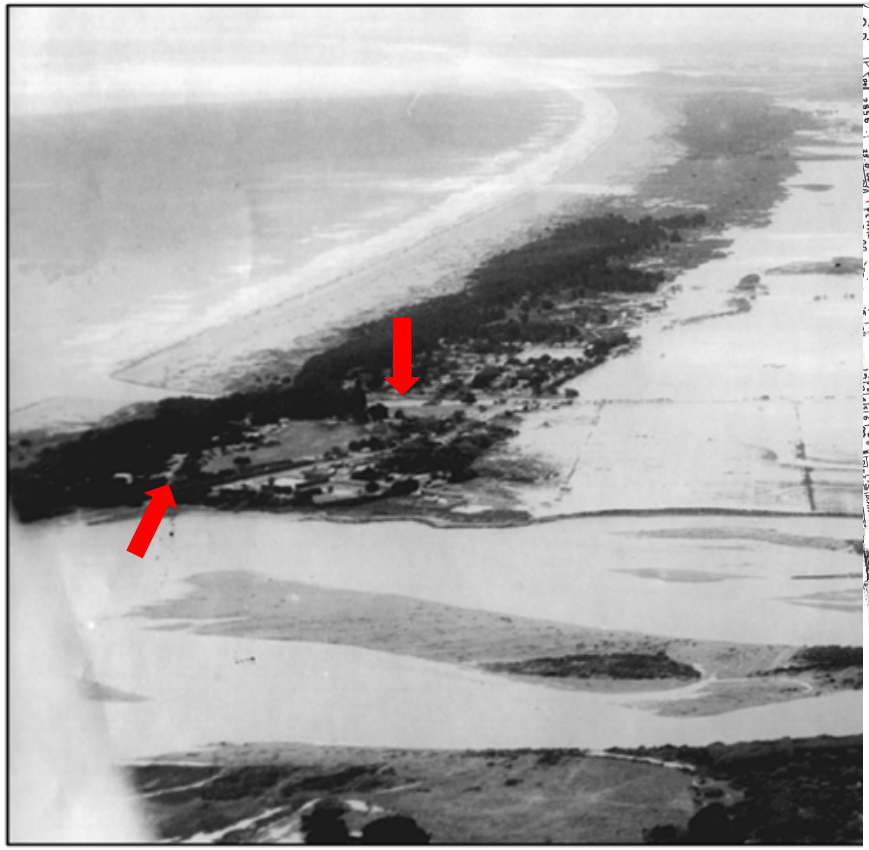


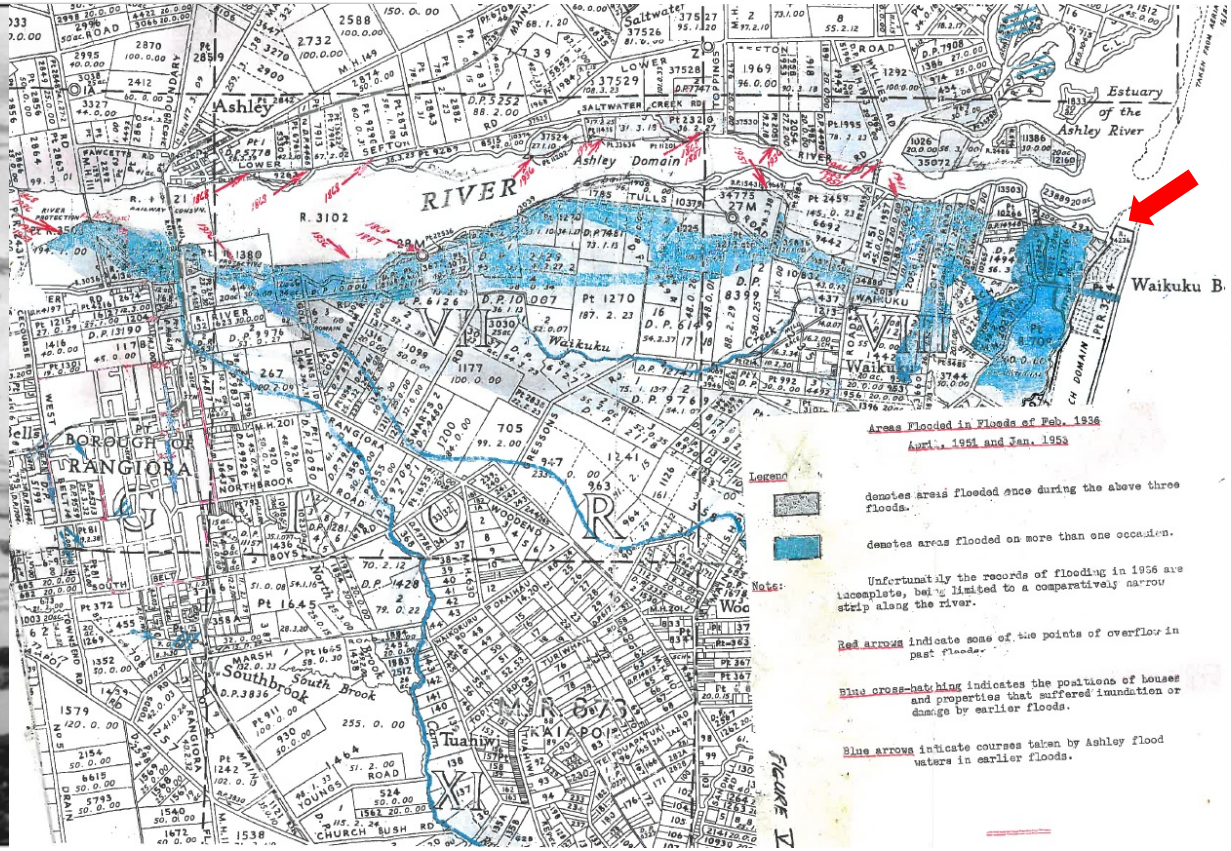
Waikuku Beach Campground

- Flooded at about 9:30pm Sunday



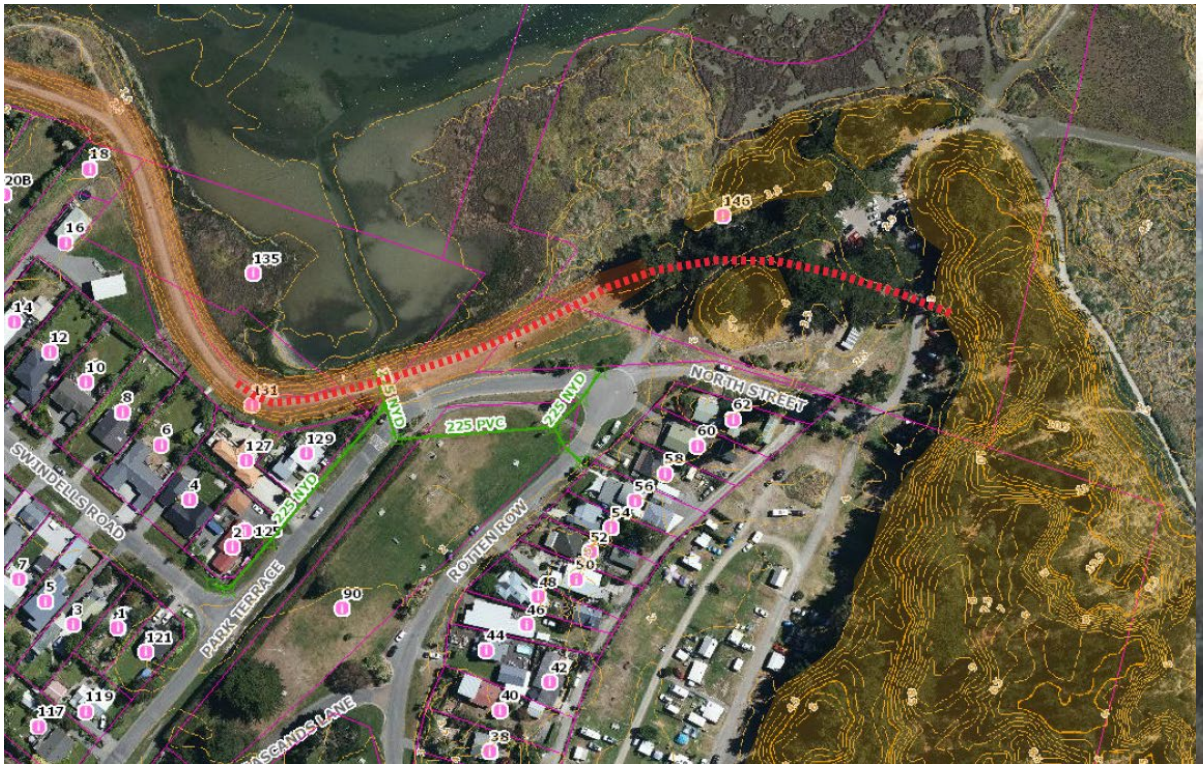
Historical Breaches of the Ashley River





Waikuku Beach Campground

- Proposed Works – Stopbank modification led by Environment Canterbury



Waikuku Beach Campground

Line Drawings

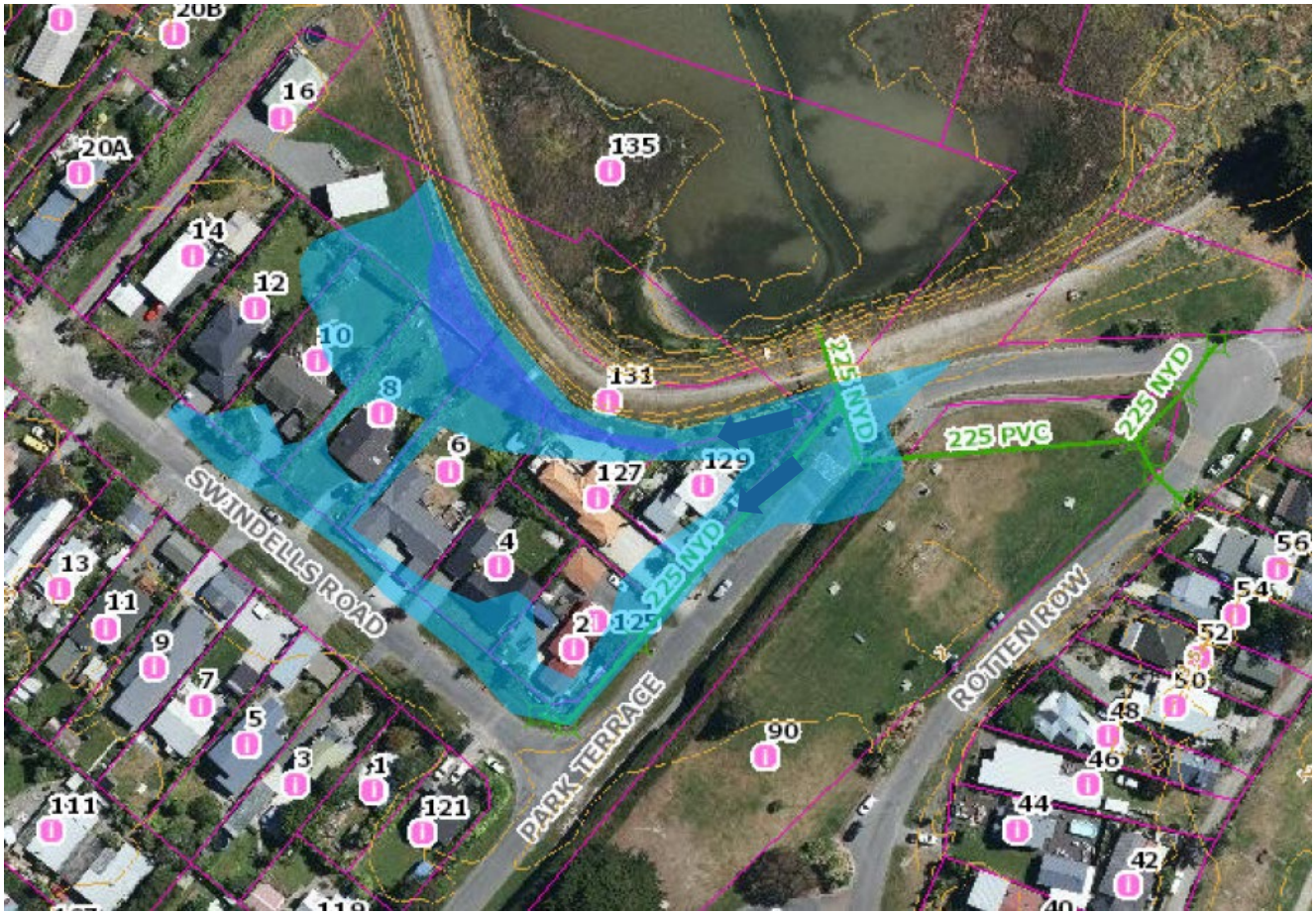
- New Construction (lift varies 300-1200mm)
- Low Lift of Existing Bank (</= 300mm)
- Rating Units with Ratepayer & Owner Details

- 500-600mm high carpark accessway ramps up over the extended stopbank
- Commence this month and take approximately 3 weeks to complete

Waikuku Beach Campground

Swindells Road

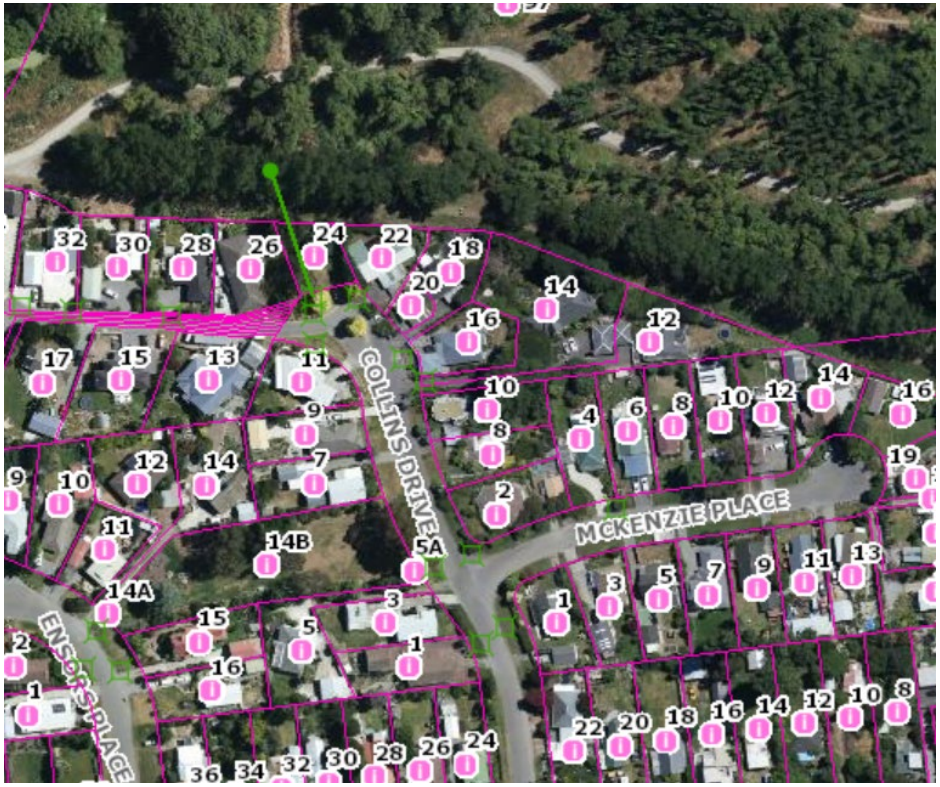
- Flooding due to backing up behind flapgate
- Back-flowed:
  - along the toe of the stopbank
  - Up Park terrace and into Swindells Road
- Pumps:
  - Deployed by landowners initially
  - Then by Council on Monday



Swindells Road

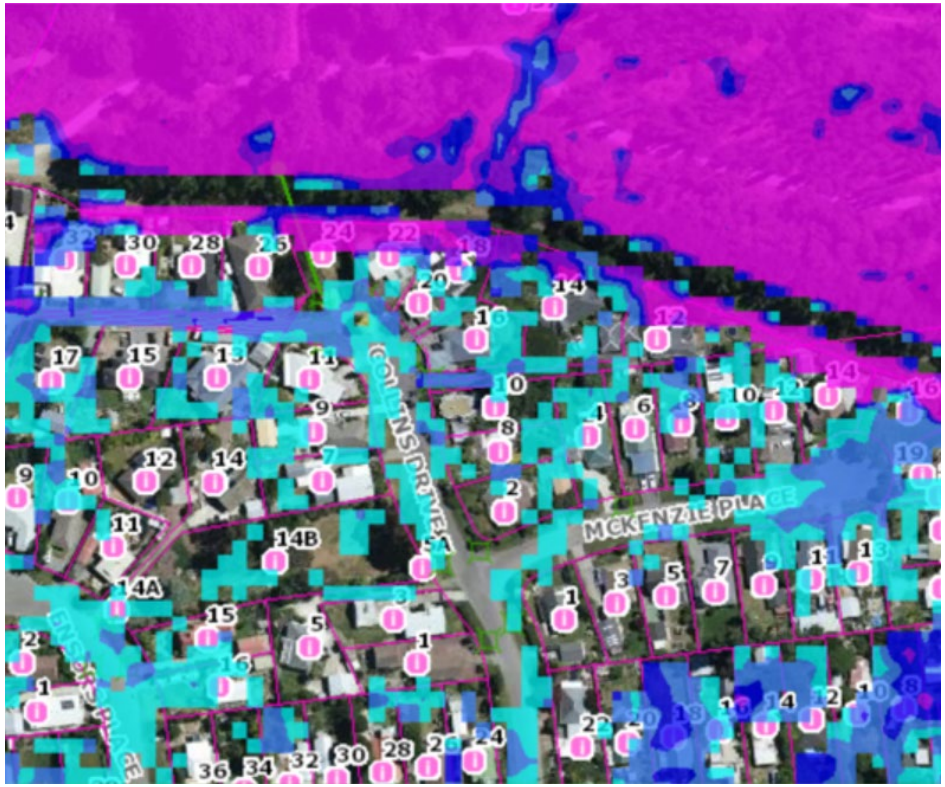
- Next steps:
  - Survey of ground level, CCTV inspection of pipework, capacity assessment of pipework and swales.
  - Options assessment:
    - Maintain existing system
    - Upgrade existing pipework and swales
    - Proactively deploy temporary pumps
    - Permanent pump system
- Actively monitor weather forecasts:
  - Ensure systems are maintained (pre-event inspections)
  - Deployment of temporary pumps (if significant events are forecast)

Collins Drive



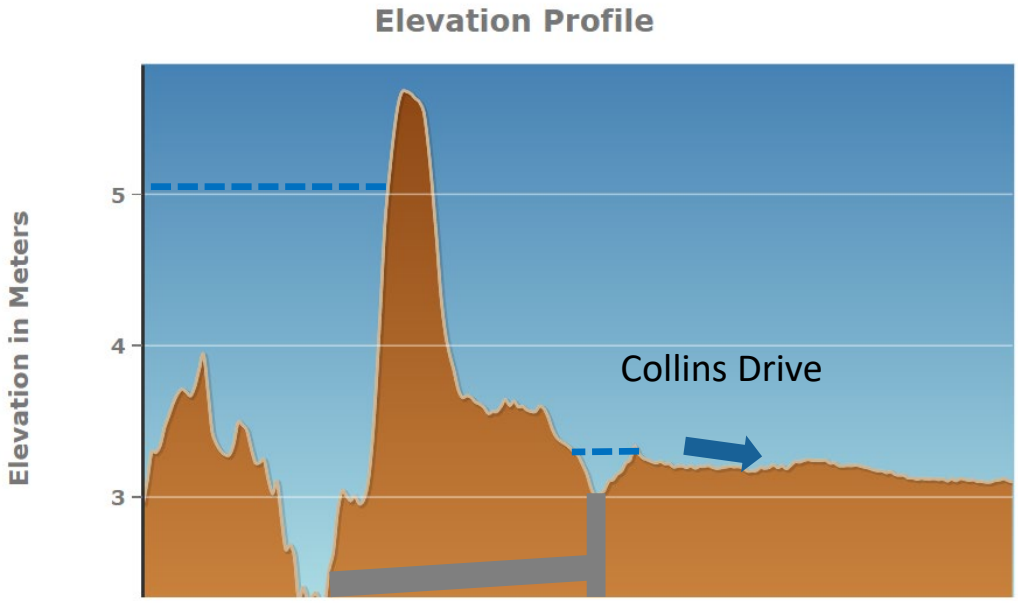
- Flooding – backflow from the Ashley River (dirty water)

Collins Drive



- Flooding – backflow from the Ashley River (dirty water)

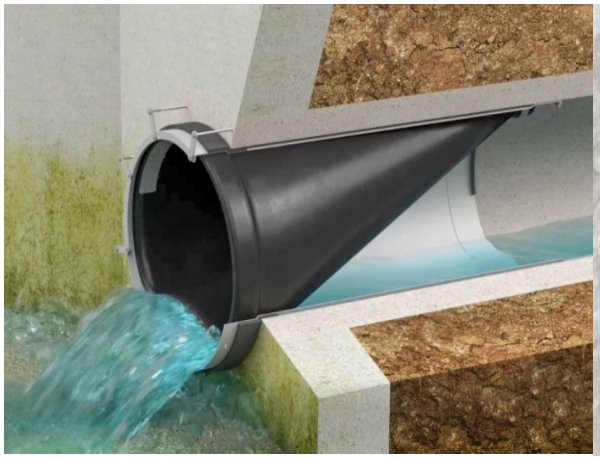
Collins Drive

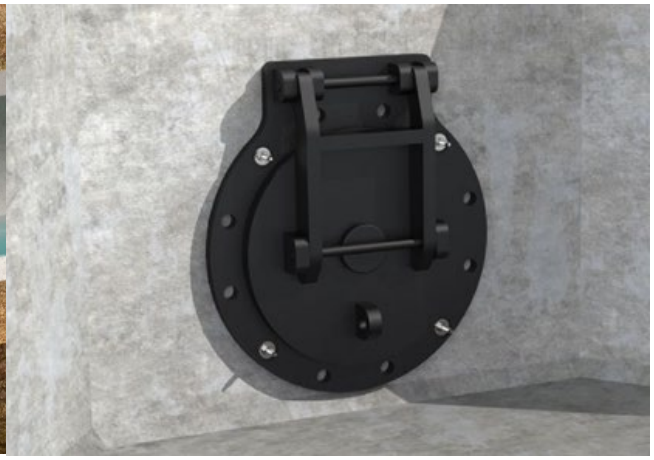


- Backflow occurred through the stormwater system

Collins Drive

- Proposed Works
  - Improve the operation of the existing flapgate - access for maintenance, protection from debris blockage during events
  - Install a secondary flapgate – potentially a Wastop valve

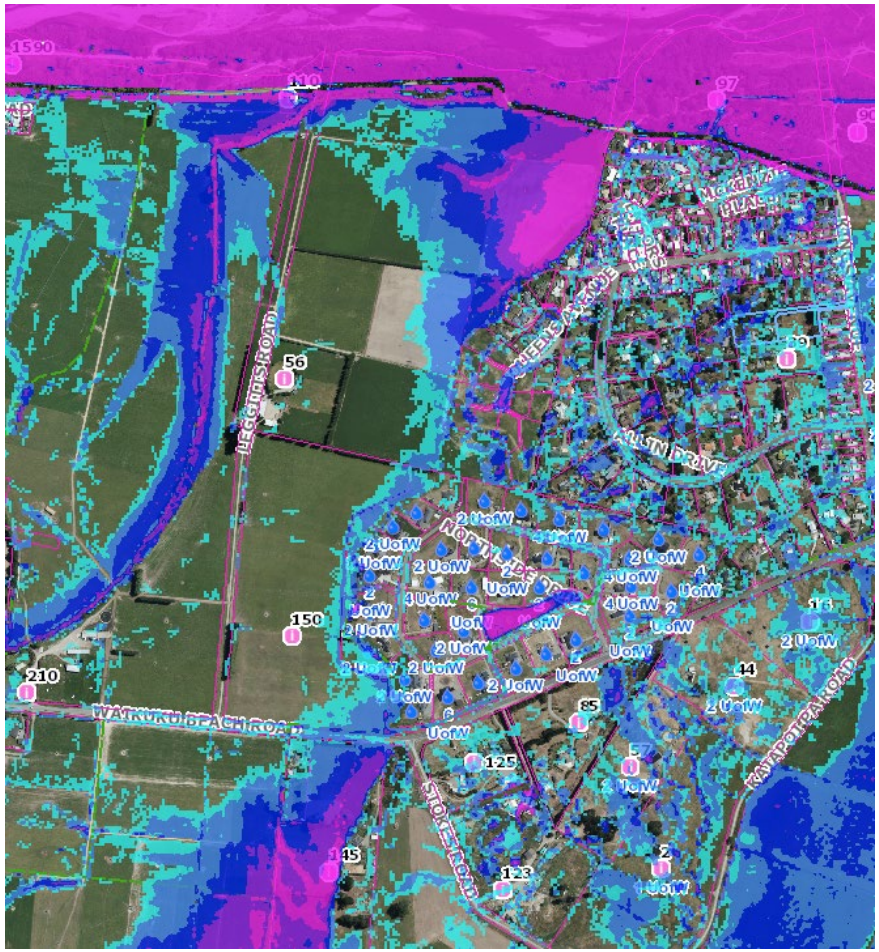


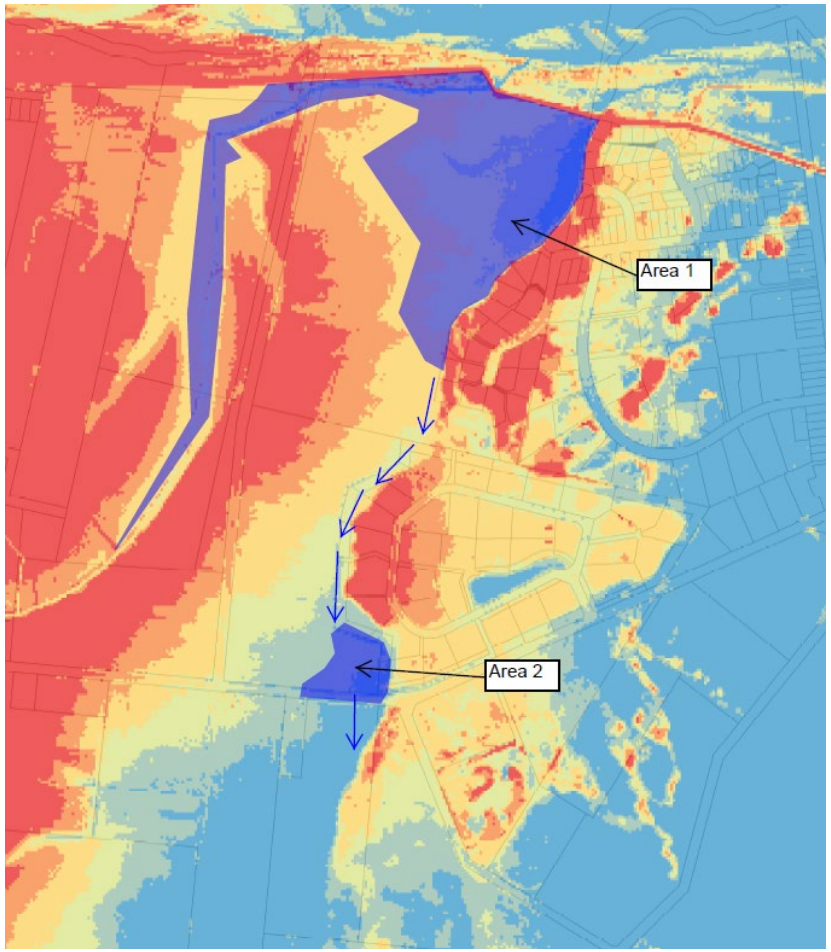


Waikuku Beach Road

- Flooding overtopping Waikuku Beach Road
  - Flow from north to south
  - Main entrance to Waikuku Beach village
- Further investigation proposed
  - Frequency of overtopping?
  - Potential need for a culvert at this location?
  - Road safety and level of service to be considered

Waikuku Beach Road





Kiwi Avenue Reserve

Kiwi Avenue Reserve

- Drainage assessment
  - Level survey of park
  - Investigate options:
    - Upgrade existing system through 33A / 35 Broadway to Park Terrace Drain
    - New system through driveway of 33A Broadway to stormwater system in Broadway Ave
    - Raise land in reserve?

Waikuku Beach Reserve

- Ponded water for extended durations
  - Stagnant – smell issues in summer
  - Temporary pumping not feasible?
- Drainage assessment (Greenspace)
  - Groundwater and geotechnical assessment (old landfill)
  - Level survey of park
  - Investigate options:
    - Filling of the low areas
    - Installing subsoil drainage
    - Converting area to a permanent wetland
    - Creating a bund around the western side
    - Installing a pipe to drain the low area

Way Forward / Timeframe

Next Steps

- Ashley River Stopbank Modifications – 4-8 weeks
  - Led by Ecan – to be undertaken as “emergency works”
- Swindells Road – Options Assessment – 8 weeks
- Collins Drive – Flapgate Improvements – 4+ weeks
- Waikuku Beach Road – Flooding Invesitgation – 6 weeks
- Kiwi Avenue Reserve – Drainage Assessment – 6+ weeks
- Waikuku Beach Domain – Drainage Assessment – 6+ weeks

Interim Measures

- Actively monitor and maintain systems
- Deployment of temporary pumps
  - If significant events are forecast

Way Forward / Feedback

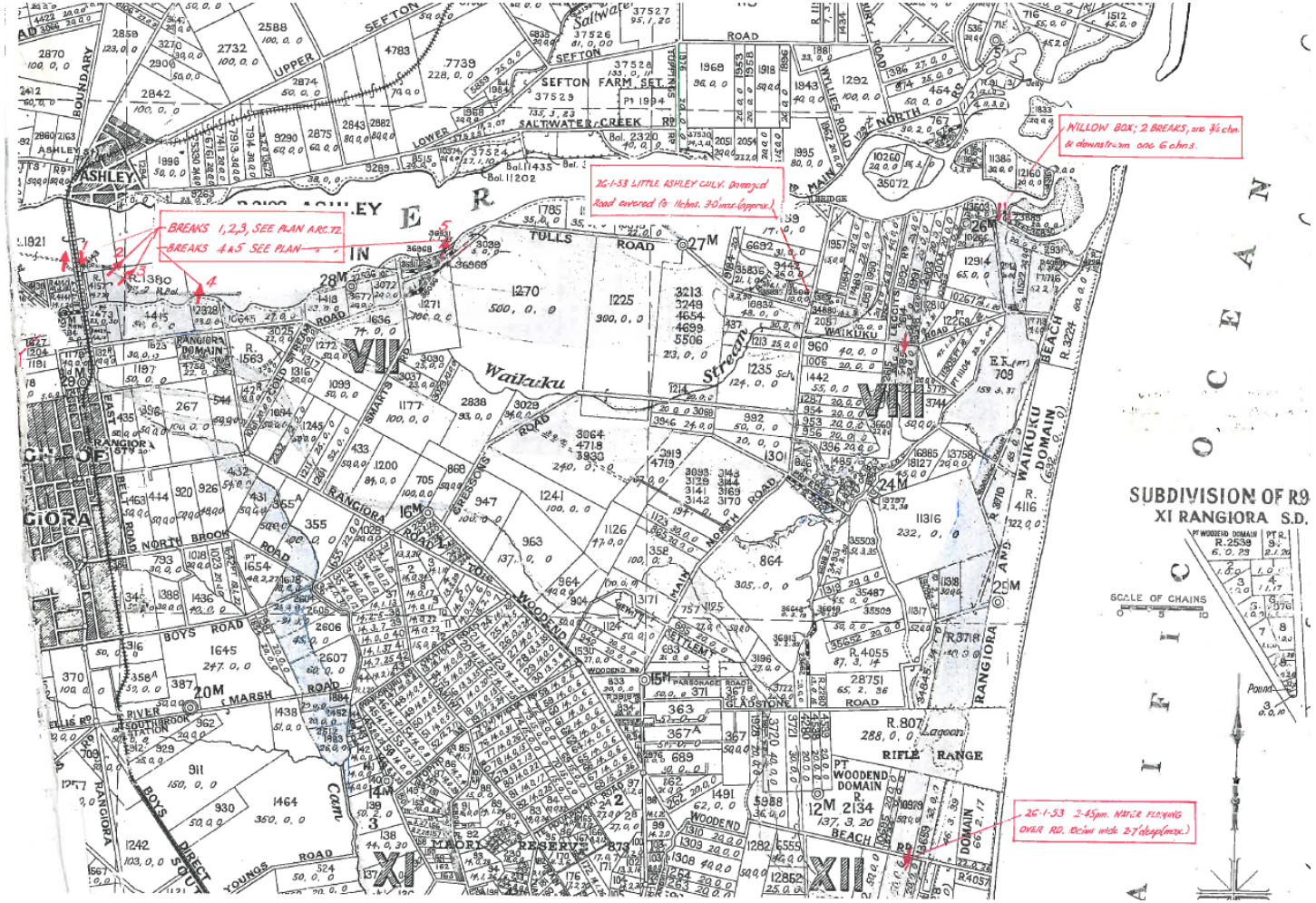
Other Areas?

- Currently assessing 250+ service requests related to this event
- We want to know about issues:
  - Fill out a feedback form tonight
  - Lodge a service request
- All will be assessed and responded to … and reported through Council in a summary report

Questions and Feedback

Taranaki Stream

Historical Plans



WAIMAKARIRI DISTRICT COUNCIL

MEMO

FILE NO AND TRIM NO: GOV-26-09-04 / 220419059444

DATE: 19 April 2022

MEMO TO: Woodend-Sefton Community Board

FROM: Caroline Fahey, Water Operations Team Leader

SUBJECT: Flooding and Drainage Issues in Waikuku Beach

A Flood team has been formed to look into all the flooding issues in the district after the May, December 2021 and February 2022 major rain events. A total of approximately 600 service requests were received during those events which are currently being investigated by the Flood Team.

The key areas in Waikuku Beach that are being investigated are Broadway Avenue, Reserve Road, Kiwi Avenue and Swindells Road. These investigations are currently underway (see table below for details).

LOCATION	ASSESSMENT
Swindells Road	Flooding occurred in Park Terrace and Swindells Road due stormwater backing up behind the flap gate. Investigation work including surveys, CCTV inspections and flood capacity assessments are underway. Options to be considered include maintaining or upgrading the existing system, deploying temporary pumps during future rain events or installing a permanent pump station.
Kiwi Avenue Reserve	Flooding occurred in the north west part of the reserve. While upgrades had previously been completed in Kiwi Avenue the stormwater system from this part of the park is inadequate. The options to be considered are upgrading the pipe out to the Park Terrace Drain or installing a new pipe out to Broadway Avenue.
Kiwi Avenue	Flooding occurred Kiwi Avenue at a low point serviced by two soak pits. In conjunction with the works planned for the Kiwi Avenue Reserve, the affected soak pits in Kiwi Ave will be serviced to ensure they function as intended. A desktop assessment will also be undertaken to determine if their positioning is appropriate.