



# **Hutt City Council and Wellington Water Report – Joint review of the slip at Point Howard**

# Document Control

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## Disclaimer

*This report has been provided in response to the Terms of Reference which are attached as Attachment "5", which identifies what inquiries and investigations are within and outside the scope of this report. It is also an initial assessment only of the events leading up to the slip. At this stage, there has not been a detailed geotechnical assessment undertaken.*

# Executive Summary

On 14<sup>th</sup> March 2023 at approx. 9:30am, a slip occurred at 78 Howard Road, Eastbourne, Lower Hutt (“the slip”) which had been first reported to Hutt City Council (HCC) and Wellington Water Limited (WWL) on the 9<sup>th</sup> January 2023.

Based on the initial site assessment, the ENGEO initial landslide assessment report states that they consider that the landslide likely occurred due to a combination of:

- Leaking Water Pipe – Based on the reported water flow from the slope leading up to the landslide event, and the repairs that occurred in the day prior to the landslide, it appears that the water main had been leaking at a moderate to high rate and saturated the near surface soils, and
- Recent Rainfall – The landslide event occurred on the day following a 22 mm rainfall event. While this is a notable rainfall event, it is not exceptionally high and therefore is unlikely to be the sole contributor to the landslide trigger.

The slip resulted in damage to power, gas, and water services as well as Howard Road resulting in restriction of the road to one lane. The slip had an immediate impact on customers with approximately 165 households being without water for approximately 48 hours and having to boil water for a further 72 hours.

Customers provided timely and accurate information about the status of the leak in the weeks prior. The sequence of events highlights problems with the flow of customer information between HCC and WWL, which impeded the timely escalation and prioritisation of this leak repair. In some aspects both HCC and WWL fell short of achieving the expected levels of service in line with the Customer Promise.

The report recommendations focus on lessons learnt through this review that may minimise future occurrences. These include:

- Addressing a number of human centric processes at both HCC and WWL which are vulnerable to single point failure.
- Addressing problems with the flow of information provided by the customer which had an impact on the prioritisation of leak and the timing of escalating its repair.
- Improvements to the leak prioritisation framework including adding the geography of the leak location (e.g. slope) and consistent implementation of the framework across WWL.

## Recommendations

### ***Recommendation 1***

That HCC reviews customer experience processes and training, including customer prompt resources for capturing key information to ensure all:

- a. interactions with customers are recorded and service requests created, and
- b. water service requests have sufficient information to allow WWL to create accurate records and be able to match duplicate requests to an existing record.

### ***Recommendation 2***

That WWL reviews processes and training for managing customer requests to:

- a. achieve a single source of the truth for the status of leaks which is updated when information (including customer information) is received.
- b. ensure multiple calls by the same customer are treated as a complaint requiring WWL, in accordance with the Customer Promise, to get back to the customer the same day.
- c. create alignment with the Customer Promise and the leak prioritisation framework.
- d. allow for the geography of the leak location (e.g. slope) within the prioritisation framework, and
- e. ensure the leak prioritisation framework is implemented consistently across WWL.

# Scope and Objective

As set out in the attached terms of reference, the purpose of this review is to inquire into and report upon the following:

The purpose of this review is to inquire into and report upon the following:

*How the slip occurred at 78 Howard Road, Point Howard, Eastbourne, Lower Hutt and identify lessons to minimise future occurrences.*

In considering this question, the reviewers have created a timeline summarising the actions of HCC and WWL from the first notification of the leak on 9 January 2023 up until WWL left the site at 6.00 am on Tuesday 14 March 2023, having repaired the leak.

The scope of the review included reviewing the following documents and sources of information:

- Risk Assessment/Priority Framework for assessing the priority for responding to leaks
- Actions taken post event including review of all open jobs in hill suburbs, leak detection sweep
- Local water network including pipe material, age, condition, previous repairs in local zone, where it featured in the renewal programme
- Local roading network including construction, previous repairs
- Geotechnical including local geology, stability, mode of failure
- Other environmental factors including recent weather pattern, earthquakes, adjacent construction
- Customer Service Request workflow including volume for context, prioritisation framework, escalations process including permit process
- Any other relevant communications relating to 78 Howard Road, Point Howard, Eastbourne
- Any other material within the scope of the review.

As part of this review, the Point Howard Association were consulted with regards to the accuracy of the records of communications with HCC in reporting the leak.

## Issues out of Scope

This review does not ascribe blame or liability to any party or person, cannot be used in any disciplinary processes with any workers involved, and will not pre-empt or duplicate any other inquiry into any incidents that come within scope of this review. The review does not inquire into, determine or report in an interim or final way or otherwise prejudice the following matters:

- Whether any questions of liability arise,
- Health and safety obligations,
- WWL's inquiry into the practices relating to the excavation and any close approach permit,
- Incident response in responding to the slip at 78 Howard Road, Point Howard, Eastbourne
- Any third party's inquiries or investigations into the slip, and
- Other leaks and slips.

An inquiry into whether health and safety practices were followed in respect of the excavation was carried out and completed on 17 March 2023. The report found that the health and safety practices were complied with.

# Sequence of events

## Background and Impact

On 14 March 2023 at approx. 9:30am, a slip occurred at 78 Howard Road, Eastbourne, Lower Hutt (“the slip”). The slip resulted in damage to power, gas and water services as well as Howard Road resulting in restriction to one lane.

Preceding the slip, WWL was made aware that a waterpipe located at or near 78 Howard Road, Eastbourne, Lower Hutt was leaking. WWL repaired the water leak at approximately 6.00am on Tuesday 14 March 2023.

The slip impacted approximately 165 households leading to residents being without water from approximately 10am on Tuesday the 14<sup>th</sup> March until 9am on Thursday 16<sup>th</sup> March (approx. 48 hours).

A precautionary boil water notice was put in place Tuesday the 14<sup>th</sup> March and lifted Sunday 19<sup>th</sup> March 2023.

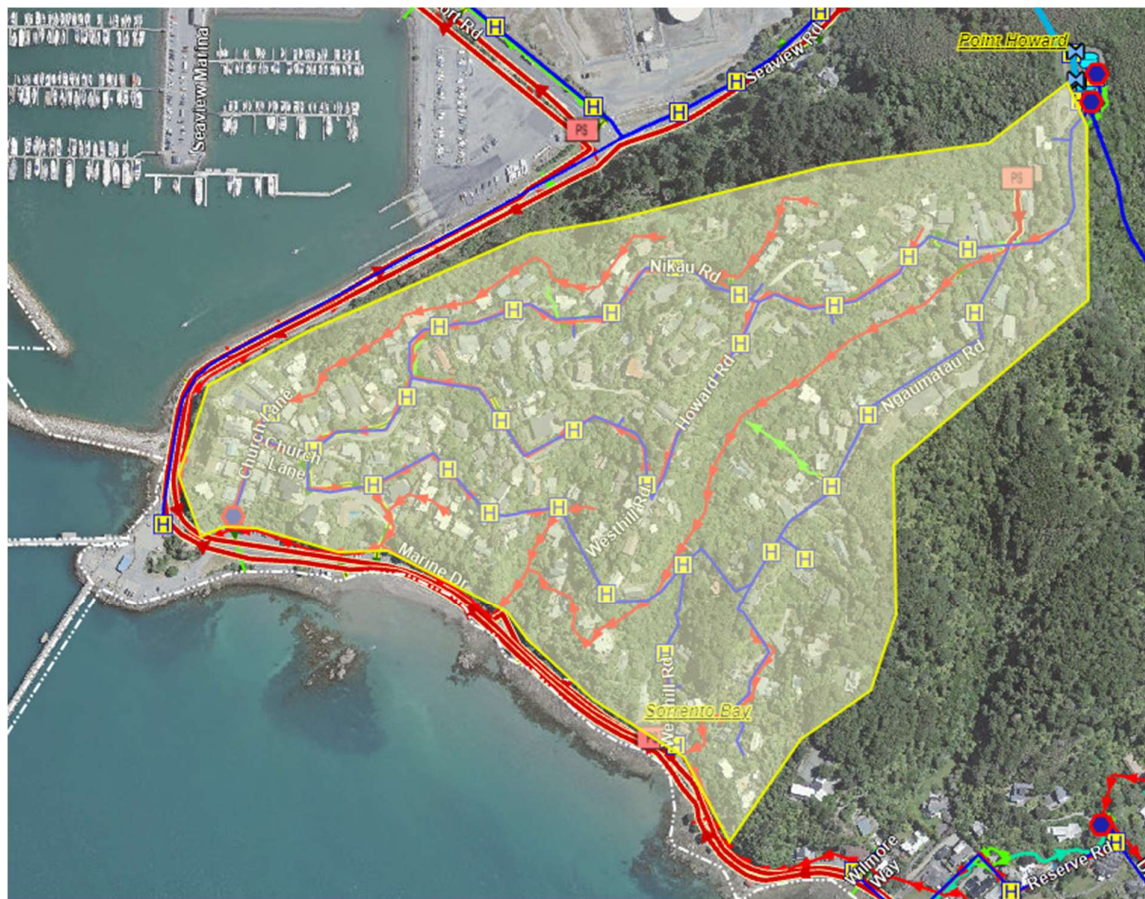


Figure 1 Point Howard, Hutt City Zone impacted.

## Events Overview

The sequence of events as represented in Figure 2 has been compiled with the best of endeavours and is sourced from a combination of documented information and personal accounts. It summarises the information received from customers, the actions of HCC and WWL from the first notification of the leak on the 9<sup>th</sup> January 2023 up until WWL leaving the site at 6:00am on 14<sup>th</sup> March 2023.

### ***Observation and Opportunity for Improvement 1***

*Collating the sequence of events was found to be problematic. Information of various types exists in different forms between HCC and WWL. In some cases secondary information was used in the absence of documented information.*

*It was discovered that a number of human centric processes exist at both HCC and WWL which are vulnerable to single point failure.*

*There is an opportunity to improve the processes and behaviours related to documented information.*

# Sequence of Events

## Customer Contact and Information

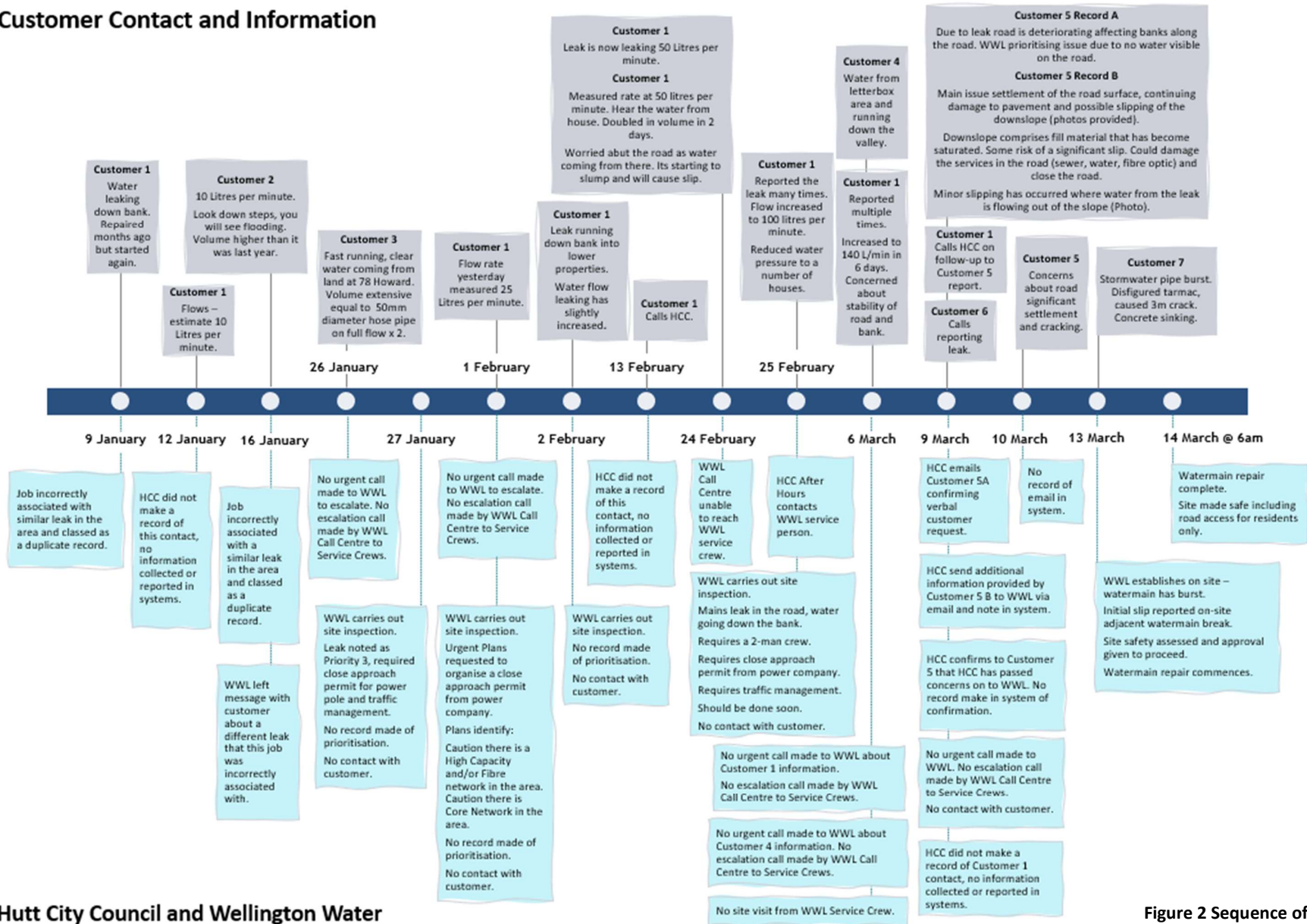


Figure 2 Sequence of Events



# Analysis and Findings

## The local roading network

Council maintains 2.4 kms of road network in Point Howard.

Council records show that the section of Howard Road between Nikau and Ngaumatau Roads has an average width of 4.5 metres and was last sealed in 2006.

No assessment has been made of the formation and maintenance of the road, nor the building or maintenance of structures near the road, whether consented or non-consented.

## The local water networks

The water main that has been leaking at the top of Point Howard is a 150mm Reinforced Concrete (RCON) main. There is 400m of 150mm RCON main in this section.

There is another 1500m of 100mm RCON mains in Point Howard.

There are no records of what was installed for these mains. They were installed by the Eastbourne Borough Council, which had very poor records. GIS show these as having a 1985 install date. This would be wrong. They would be the original mains that were installed when the reservoir was built, which was pre-1941 and perhaps as early as the mid 1930's. So, the pipe is at least 80 years old.

The repair history of RCON mains failures in Point Howard since 2005 is as follows:

- 150mm RCON - 5 failures up to the current leaks.
- 100mm RCON - 21 failures

Most of the leaks have been a failure of the rubber joint, not the pipe itself.

The RCON water mains in Howard Road and Nikau Rd, have been identified for renewal as part of the HCC water main renewals. The renewal is being progressed with delivery of this work for 2027 to 2028.

### **Observation**

*There is a good understanding of the water network and its performance. Renewals are identified for the areas of concern within the next 5 years. If the renewal was not identified and scheduled within the current Long Term Plan a recommendation would have been made to review the schedule.*

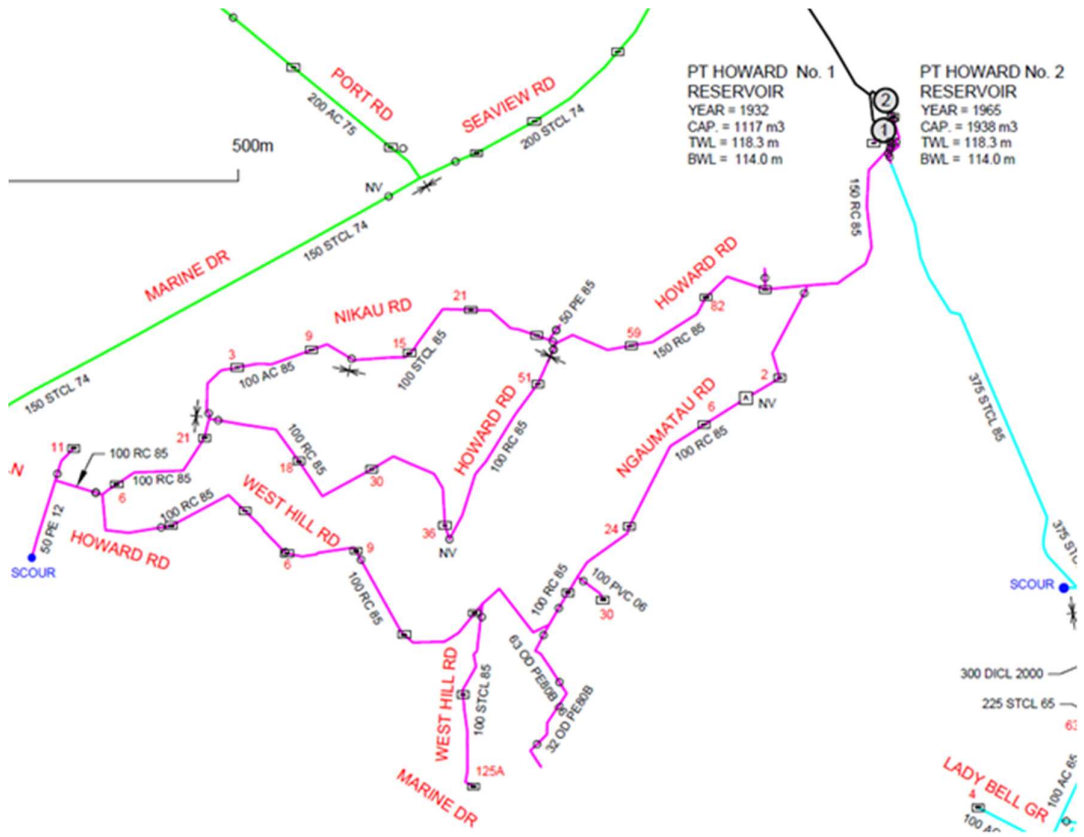


Figure 3 Diagram of watermains in the Point Howard area

## External environment

Information on some of the features of the external environment is provided for context. The external environmental factors listed are anecdotal. There has been no direct study into the relationship between these factors and the slip. A dedicated technical report would be required before any conclusions could be drawn.

### Climate

NIWA Annual Climate Summary for 2022 published in January 2023 <sup>1</sup>notes the following points with regards to rainfall and soil moisture:

- Rainfall - Rainfall was above normal (120-149% of annual normal) or well above normal (>150% of annual normal) for parts of Northland, Tauranga, Gisborne, the Central Plateau, southern Taranaki, parts of Manawatū-Whanganui, much of Wellington, Nelson, northern Marlborough, parts of Tasman, the West Coast near Westport, and pockets of Canterbury.
- Soil moisture - At the end of December, soil moisture levels were higher than normal in eastern Northland, Auckland, Bay of Plenty, parts of Hawke’s Bay, southern Taranaki, parts of Manawatū-Whanganui, southern Wellington, and pockets of Canterbury.

Greater Wellington Regional Council Environmental Monitoring and Research provides rainfall data for the region. Information for the closest rainfall station at Waiwhetū Stream at Seaview WWTP is provided below in Figure 4.

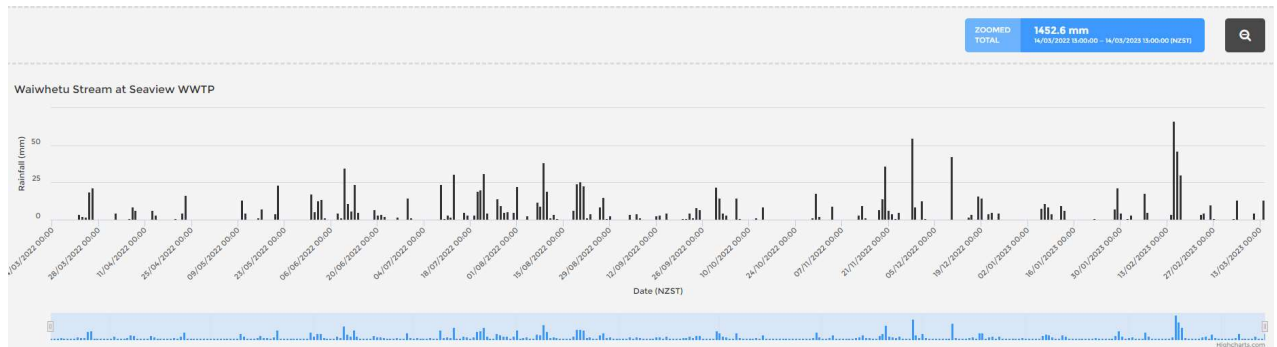


Figure 4 Rainfall graph Waiwhetū Stream at Seaview WWTP 14 March 2022 to 2023

### Ground shaking

The GeoNet Quake Search application provides information on earthquakes. Figure 5 provides the earthquakes above magnitude 5 in the last 12 months.

<sup>1</sup> ([https://niwa.co.nz/sites/niwa.co.nz/files/2022\\_Annual\\_Climate\\_Summary\\_FINAL\\_v3.pdf](https://niwa.co.nz/sites/niwa.co.nz/files/2022_Annual_Climate_Summary_FINAL_v3.pdf))

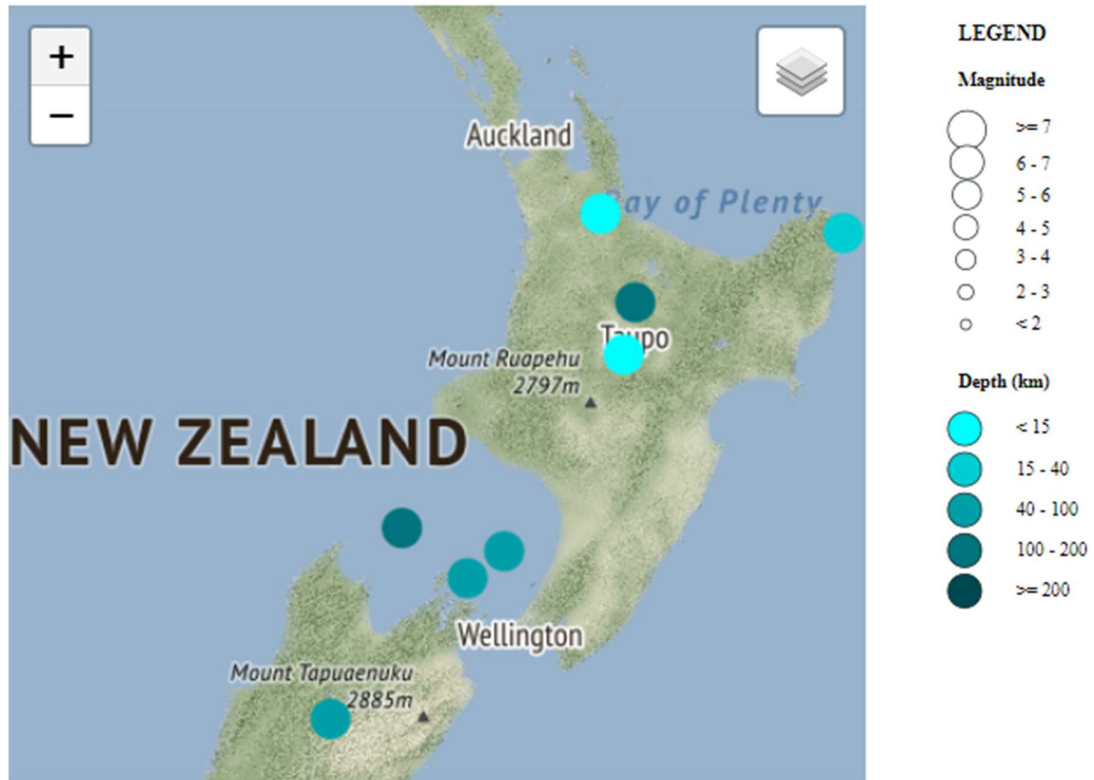


Figure 5 Earthquake above magnitude 5 for the 12 months ending 14 March 2023

## Geotechnical

The terms of reference of this review required a geotechnical report. Within the time constraints HCC commissioned ENGEO to complete only an initial assessment of the landslide at 76 and 78 Howard Road, which does not assign causality.

The ENGEO initial landslide assessment report provides an 'Initial landslide assessment' which considers only the site and geotechnical hazard, interpretation of the hazard, an assessment of risk to Council Assets and appropriate remedial works as well as short term actions. The report can be found Attachment 1.

Key points directly from the landslide assessment with regards the slip are repeated as follows:

### ***Site and Geotechnical Hazard***

- Howard Road appears to have been formed through cut and fill works. On the upslope side of the road, slightly weathered Greywacke Sandstone is exposed within the roadcut which is formed at approximately 60. to 70. from horizontal. The slope above the cutting is well vegetated with small to medium sized native plants.
- The failure mechanism appears to be shallow translational sliding of the surface fill and colluvium soils. It appears that the upper 1 m to 1.5 m of soil has been released downslope.
- Within the asphalt surface of the road to the northeast and southwest of the site there are multiple depressions and cracks suggesting past movement / settlement. Vegetation growth within cracks suggests that these have not formed in conjunction with the recent landslide.
- Residents noted water flow from the slope in the weeks leading up to the landslide event. We observed a series of small trenches (approximately 200 mm wide and 200 mm deep) that had been formed at the base of the gully. It is our understanding that these were formed by the residents in an attempt to direct the water flow.
- The watermain repair trench was completed in the approximate centre of Howard Road, parallel to the direction of the road. On the side of the trench closest to the road cut (upslope), we observed moderately weathered Greywacke Sandstone. On the downslope side of the road cut a combination of fill and colluvium soils were observed.

### ***Interpretation of Geotechnical Hazard***

Based on the initial site assessment, the ENGEO initial landslide assessment report states that they consider that the landslide has likely occurred due to a combination of the following:

- Leaking Water Pipe – Based on the reported water flow from the slope leading up to the landslide event, and the repairs that occurred in the day prior to the landslide, it appears that the water main had been leaking at a moderate to high rate and saturated the near surface soils.
- Recent Rainfall – The landslide event occurred on the day following a 22 mm rainfall event. While this is a notable rainfall event, it is not exceptionally high and therefore is unlikely to be the sole contributor to the landslide trigger.

## Review of all Hutt City Council leaks

At the end of February WWL had:

- a. 2,977 confirmed leaks across the Council networks,
- b. 930 confirmed leaks in the HCC area,
- c. repaired 181 leaks in the HCC area that month, and
- d. repaired 1547 leaks in the HCC area since 01 July 22

Duplicate reporting of leaks was averaging 46% requiring WWL staff to reconcile new leak to leaks already registered in the system (this requires reconciliation of the location of the leak against reports already in the system). For the month of February WWL received 2950 water service requests across the Council networks with 1046 duplicates. Of those service requests 983 were from HCC with 437 being duplicates.

Across the networks approximately 7% of leaks were classed as urgent and 8% were high priority. 62% of all known leaks from 01 July 2022 to end of February had been repaired in the HCC area (for comparison this percentage was 61% in WCC area).

### ***Customer Service Requests Process***

HCC as the asset owner is responsible for managing customer requests and enquiries. It manages these through the CONFIRM Request for Service (RFS) system, which has been used for many years and is currently planned for replacement over the coming year. Customers can report problems to Council in two main ways; via an on-line App, 'Report a Problem' or through telephone contact with the Customer Contact Centre.

Requests for three water services made through the HCC Customer Contact Centre represent around 13% of all calls received. Each request is given an individual enquiry number and priority for actioning by the relevant section of Council or for water enquiries through WWL which has a direct link to the RFS system. Urgent reports are phoned through to WWL for action.

Duplicate requests for the same issue are entered for record purposes but are then closed and related to the parent request. Actioning officers record actions that have been taken in the system which then forms a written record of how the issue has been resolved.

Service crews visit the site and corroborate the information provided by the customer in the service request.

The diagram in Figure 2 Sequence of Events, shows there were problems with the flow of information provided by the customer which has had an impact on the prioritisation of leak and the timing of escalating its repair. There were multiple opportunities for these problems to be corrected, including by; collecting the correct information from the customers, recording it, escalating it, relaying it to service crews, reviewing the request information, contacting the customer for verification, and recording re-assessment of the leak repair priority.

**Recommendation 1**

That HCC reviews customer experience processes and training, including customer prompt resources for capturing key information to ensure:

- a. all interactions with customers are recorded and service requests created,
- b. all water service requests have sufficient information to allow WWL to create accurate records and be able to match duplicate requests to an existing record.

**Observation and Opportunity for Improvement 2**

*The reconciliation and management of duplicate records was found to be a significant factor in the problems faced during the collation of the sequence of events. Human centric processes involved in managing the duplicates provides a potential vulnerability in terms of information being missed.*

*There is an opportunity to improve the processes and behaviours related to the management of duplicate records and the customer processes overall.*

## Customer Promise

The WWL *Customer Promise* provides customers with a clear understanding of what they can expect from WWL and the Levels of Service WWL delivers. The promise provides the methodology for assigning a priority rating<sup>2</sup>, time to advise customers, and a time to advise customers of the outcome. The initial reporting of the leak occurred 9 January 2023 and the information in that customer report would indicate a non-urgent (P3) fault would have been the appropriate classification. The ‘Time to restore service’ timings are defined for WWL in the [HCC Annual Plan 2022-23](#).

There is no evidence that the customer who reported the leak on 9 January 2023 was advised of the prioritisation or subsequently advised of the outcome within 25 business days in accordance with the timings of the Customer Promise, provided in Attachment 2. Unfortunately, some early customer reports of the leak were wrongly associated with a leak further up the road and those customers may have received automated messages that the leak had been resolved, which would have confused the customer who could still observe the leak.

<p><b>An incident</b> is defined as an outage where significant number of customers are without service, severe environmental damage is likely or the impact of the outage on the economy of the city is threatened.</p>	<p><b>An urgent fault</b> is where service is interrupted or there is an imminent health, environmental and/or safety risk that requires us to deal with these quickly.</p>	<p><b>A non-urgent fault</b> does not have the same immediacy for action so can we batch jobs and complete them as our crews become available. The timing of completing these non-urgent works varies depending on the level of incidents and urgent work being managed.</p>
		

**Figure 6 WWL Customer Promise fault priority rating definitions**

<sup>2</sup> The priority rating articulated in the customer promise is not to be confused with the WWL leak prioritisation framework which is used to establish prioritisation of leak repair.



Priority Rating	Time to advise Customers	Time to restore service	Time to advise outcome
Significant Incidents and outages	Within 30 minutes via Phone, SMS messaging*, all Social Media platforms (Twitter, Neighbourly, Facebook, Instagram), WW Website and media if required	8 hours	1 business day Note: Status updates will be made via all channels every two hours until resolution.
Urgent faults	1 hour via Phone, Twitter, SMS messaging*	8 hours	1 business day
Non-urgent faults	1 hour via SMS messaging	20 business days	25 business days
Planned works	Work programme – BAU channels	As programmed	As programmed

**Figure 7 WWL Customer Promise timeframes for advising customers**

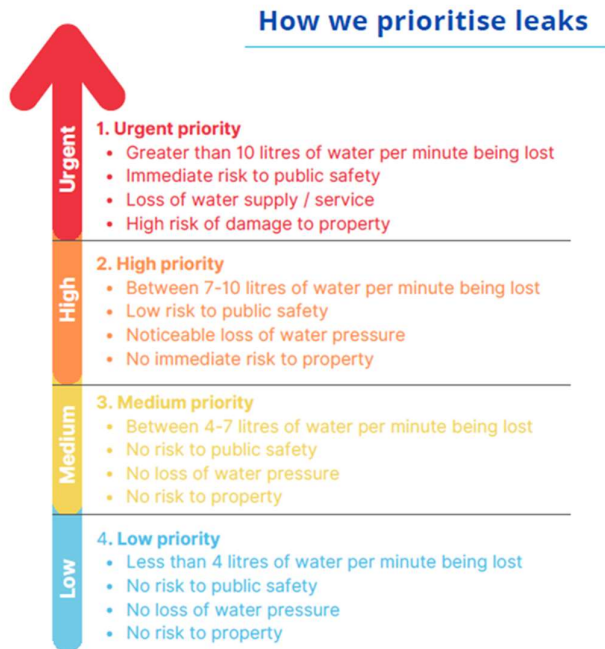
The first subsequent customer call that may have warranted a changed priority rating was received on the 24 February 2023 and indicated that ‘the leak had increased, and the customer was worried about the road which is starting to slump.’ It is reasonable that a customer viewing the Customer Promise would consider that this slumping posed a safety risk and therefore qualified as an urgent fault (P2). There is no evidence that a priority re-categorisation was considered by WWL or that the customer was advised of the prioritisation, or subsequently advised of the outcome within the timings of the Customer Promise.

Regardless of the prioritisation assigned, the Customer Promise indicates WWL will ensure a general enquiry will be replied to within 1 working day, and a reported issue will be prioritised with a response being provided within an hour. There is no evidence of such a response by WWL being provided to the customers who reported the leak, with the exception of one phone message being left to a customer on 16 January 2023.

Broadly, if the Customer Promise had been fulfilled the customer information would have ensured an earlier resolution of the leak and therefore reduced the leak as a factor in how the slip occurred.

## Alignment to Priority Framework

WWL prioritises leak repairs utilising the prioritisation framework below which is recorded within the Maximo system. This framework was introduced in late 2022 in response to high water losses across the networks.



**Figure 8 WWL leak prioritisation framework**

The evidence of the nature of the leak and how it developed is within the information provided by the customers which indicated a leak that grew in size from 9 January 2023 until the slip occurred on 16 March 2023; with one exception on the 25<sup>th</sup> February 2023 where after a site visit WWL noted 'should be done soon'. During this period the leak received a range of prioritisations depending on the information provided by the customer and how the leak was assigned within Maximo. It was initially classed within Maximo as a P1 on 16<sup>th</sup> January 2023 but wrongly associated with a different leak, it was graded a P2 on 26<sup>th</sup> January 2023 when a unique work order for the leak was first created, and then assigned P3 status on the 13<sup>th</sup> March 2023 when the leak was repaired. Anecdotal evidence is that it was being treated as a P3 on completion of the site visit on 27<sup>th</sup> January 2023.

Customer information continued to be received which provided data indicating a higher prioritisation was appropriate but there was no reclassification of the leak as a P1 in Maximo. On 1<sup>st</sup> February 2023 a customer estimated the leak at 25 Lt/min which would meet the threshold for a P1; the same customer consistently advised of increasing rate of leakage and by the end of February was estimating 100 Lt/min.

Maximo is used as the system of record for how WWL is assessed against key performance indicators so to protect the integrity of the performance data, there is a practice within WWL that, once a priority has been set by the Councils, the priority is not to be changed by WWL in Maximo. The result of this is that there is no single record of the current prioritisation of all service requests. Additional information received by WWL may indicate a higher prioritisation is justified, however the prioritisation recorded in Maximo, in general, remains the same. Instead of using Maximo to escalate a service request, the practice within WWL is to either send an email or call the relevant depot to inform them of the change in priority and to provide

them with any new information about the request. On occasions the customer information that is recorded in Maximo is not being viewed by the operational depot team prior to visiting or at the site of the reported leak.

This manifested when WWL visited the site on the 27<sup>th</sup> January, 1<sup>st</sup> February, and 25<sup>th</sup> February 2023; if HCC and WWL processes ensured that all customer information was viewed by those inspectors it would have enabled them to make a different prioritisation of the leak on those dates

***Recommendation 2***

WWL reviews processes and training for managing customer requests including;

- a. A single source of the truth for the status of leaks is provided and updated when information (including customer information) is received.
- b. To treat multiple calls by the same customer as a complaint requiring WWL, in accordance with the Customer Promise, to get back to the customer the same day.
- c. To review the customer promise to align with the leak prioritisation framework.
- d. The leak prioritisation framework is amended to allow for the geography of the leak location (e.g. slope).
- e. The leak prioritisation framework is implemented consistently across WWL.

# Conclusions and Recommendations

The ENGEO initial landslide assessment report considered that the landslide likely occurred due to a combination of the leaking water pipe and recent rainfall. However, as noted previously, this report only provides an 'Initial landslide assessment' which considers only the site and geotechnical hazard, interpretation of the hazard, an assessment of risk to Council Assets and appropriate remedial works as well as short term actions.

Customers provided timely and accurate information about the status of the leak, and it is reasonable to expect that WWL would provide responses in accordance with the Customer Promise and prioritise the leak repair in accordance with the prioritisation framework. In both instances WWL fell short of achieving the expected levels of service.

The following recommendations are provided to minimise the potential for leaks to contribute to future occurrences:

## Recommendations

### **Recommendation 1**

That HCC reviews customer experience processes and training, including customer prompt resources for capturing key information to ensure:

- a. all interactions with customers are recorded and service requests created,
- b. all water service requests have sufficient information to allow WWL to create accurate records and be able to match duplicate requests to an existing record.

### **Recommendation 2**

WWL reviews processes and training for managing customer requests including:

- a. A single source of the truth for the status of leaks is provided and updated when information (including customer information) is received.
- b. To treat multiple calls by the same customer as a complaint requiring WWL, in accordance with the Customer Promise, to get back to the customer the same day.
- c. To review the customer promise to align with the leak prioritisation framework.
- d. The leak prioritisation framework is amended to allow for the geography of the leak location (e.g. slope).
- e. The leak prioritisation framework is implemented consistently across WWL.

### **Observation and Opportunity for Improvement 1**

*Collating the sequence of events was found to be problematic. Information of various types exists in different forms between HCC and WWL. In some cases secondary information was used in the absence of documented information.*

*It was discovered that a number of human centric processes exist at both HCC and WWL which are vulnerable to single point failure.*

*There is an opportunity to improve the processes and behaviours related to documented information.*

***Observation and Opportunity for Improvement 2***

*The reconciliation and management of duplicate records was found to be a significant factor in the problems faced during the collation of the sequence of events. Human centric processes involved in managing the duplicates provides a potential vulnerability in terms of information being missed.*

*There is an opportunity to improve the processes and behaviours related to the management of duplicate records and the customer processes overall.*

# List of attachments

Number	Description
1	ENGEO Hutt City Council Initial Landslide Assessment Report 76 and 78 Howard Road Point Howard, 22 March 2023
2	Wellington Water Customer Promise, 23 September 2021
3	Wellington Water, Addressing Leaks and Water loss Dashboard, 6 March 2023
4	Hutt City Council Annual Plan 2022-23, Page 24, Water Supply Statements of service performance
5	Terms of Reference for Hutt City Council and Wellington Water Limited Review of the slip at Point Howard, 24 March 2023