5 DECISION REPORTS

5.1 WATER SERVICES DELIVERY PLAN - FURTHER DEVELOPMENT

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Attachments:
1. **Waitaki District Council Water Services Delivery Plan Assessment report**
2. **The Stage 1 Condition Grading Assessment Report of water network**
3. **The Stage 2 Scope of Works Improving Confidence in the Condition of Critical Water networks assets**
4. **Delivery Model Assessment**

PURPOSE

To make decisions on the next steps to produce a compliant Water Services Delivery Plan following receipt of letters from the Minister of Local Government, the Water Panel Assessment Report and discussions with the Water Facilitator

EXECUTIVE SUMMARY

Following the confirmation of the appointment of a Crown Facilitator and receipt of the detailed feedback on the Water Services Delivery Plan (WSDP), Council needs to start making decisions to progress the development of a revised WSDP. The first matters to be considered are approving the next stage of the planned review of asset condition and whether alternative delivery models are to be investigated and if so, which models.

OFFICER RECOMMENDATIONS

That Council:

1. **Receives** the following information:
   - The detailed Water Service Delivery Plan assessment report – attachment 1
   - The Stage 1 condition assessment report of water networks – attachment 2
   - Stage 2 scope of works for improving confidence in the condition of critical water networks assets – attachment 3
2. **Approves** stage two of the asset condition assessment project with a maximum budget of $250,000 to be funded from loans as indicated in the Long-Term Plan.
3. **Agrees** to conduct further investigations of alternative service delivery models with a focus on either a Timaru / Waitaki based arrangement or rejoining the Southern Water collaboration.

CONTEXT, ANALYSIS AND ADVICE

Background and Current Situation

Since the Havelock North incident in 2016, successive governments have sought to reform water services to deliver higher standards and investment in water infrastructure. The previous

Government's approach was to establish independent organisations to take on the responsibility water services. The current Government's approach is for each council to select from a range of delivery arrangement options. The common feature of both reforms is the need to address long term asset management, compliance and performance issues. To achieve this, additional regulations and performance standards have been developed and must be achieved. Monitoring the achievement of these standards will fall to Taumata Arawai, the Commerce Commission and the Department of Internal Affairs.

The current government's water reforms, Local Water Done Well, required councils to submit Water Services Delivery Plans by 3 September 2025, choosing from a limited number of delivery options and setting out how they will deliver the required standards and investment in a financially sustainable way.

Council commenced work more than a year ago in responding to the (then) emerging Local Water Done Well reforms. Analysis was undertaken of the current position of water infrastructure in Waitaki, and options analysis was undertaken with councils across the South Island. Once it was established that a "whole of island" approach was not viable, more localised approaches were investigated. Although Selwyn District attempted to develop a multi-Council option, the most relevant further analysis was an Otago / Southland based model. However, Council did continue to communicate with other neighbouring Councils to understand their intended approaches.

The Otago / Southland model analysis was completed in late 2024 and resulted in most Councils in the two regions choosing to pursue alternate models. The most significant grouping to come out of the Otago / Southland work was the Southern Water Done Well (SWDW) consisting of Clutha, Gore, Central Otago and Waitaki. This grouping became Waitaki's preferred option as it was seen at the time as most beneficial to the community.

There was no equivalent work undertaken in the Canterbury or South Canterbury areas. Initial discussion did occur with Mackenzie, Waimate and Timaru, and limited progress was made. However, once it was established that more than one water service delivery option had to be consulted on, work on a joint option was progressed. It was during this development period that Timaru joined and then withdrew from the SWDW grouping.

The SWDW grouping undertook analysis to look at the viability of this option. This analysis demonstrated there would be benefits, including efficiencies and cost savings for each council after the costs of setting up a new CCO and running the CCO were taken into account. Peer reviewing of the analysis concluded that the savings were conservative and likely to be higher than projected. The grouping of councils had commenced working through the terms of the partnership to meet each council's needs such as voting rights, shareholding and arrangements to ensure local charging so that each district met its own costs and was not subsidising or subsidised by other districts. It was on this basis a Commitment Agreement was negotiated and entered into in February 2025, along with a commitment of further work.

High level analysis also took place on the potential of a partnership with the South Canterbury councils of Timaru, Waimate and Mackenzie districts. Whilst some of the assumptions and modelling varied slightly, this too showed there would be benefits, including efficiencies and cost savings for each council after the costs of setting up a new CCO and running the CCO were taken into account. Planning on how the partnership and CCO would operate was not advanced, in part due to the uncertainty of Councils commitment to the model.

At the conclusion of these sets of work, Council consulted with the community on four options in May and June 2025.

On 8 July 2025, Council considered the results of the consultation on delivery models to form the basis of the Water Services Delivery Plan. At the meeting it was decided to select an In-house delivery model and move away from the previous preferred model of the Southern Water joint CCO.

Following public workshops and feedback on a draft WSDP, at its meeting of 26 August 2025 Council adopted its Local Water Done Well Water, Waters Services Delivery Plan which was then submitted to the DIA.

On 6 October 2025, the Secretary of Local Government sent a letter to the Chief Executive rejecting the Council's Water Services Delivery Plan on the basis of insufficient information on asset conditions and the potential impact on investment required in the plan. The letter required Council to submit a revised plan following asset condition work and encouraged the Council to also consider alternative delivery options.

On 4 November 2025 the Minister for Local Government wrote to the Mayor-elect to set out his intention to Appoint a Crown Facilitator to support the Council in revising its WSDP. In his letter the minister also encouraged the Council to consider other delivery models.

25 November 2025 – Public Workshop Water Services

Since the last meeting there has been confirmation that Hon. Amy Adams has been appointed as a Water Facilitator. Hon. Adams has had one briefing with Council and various other meetings in relation to the WSDP.

The letter from the Secretary of Local Government rejecting the submitted WSDP and considered on 4 November, highlighted the various matters that caused the plan to be rejected. These matters included:

- Concerns regarding the level of asset condition data.
- A need to update capital expenditure, revenue and other funding allowing for the outcome of the asset condition data
- Concerns about the viability of the proposed delivery model.

In addition, the Facilitator has passed on concerns regarding the compliance issues Council faces and the capacity to deliver the proposed improvements.

Asset Condition Assessment

Following the approval given on 4 November, officers commissioned and have now received the initial report on asset condition (Stage 1 Desktop Review). It should be noted that the scope of work for the report was discussed and endorsed by representatives of the Department of Internal Affairs (DIA). This report is attachment 2. As discussed in the 25 November workshop, it is the view of officers that the Stage 1 desktop review generally confirms Council's understanding of asset condition and does not materially affect the overall position taken in the WSDP, although some adjustment of renewals budgets may be required.

The most useful information in the report was that it highlighted the areas of greatest difference and uncertainty in relation to various classes of assets and therefore the items where further investigation would provide the greatest value. It is proposed that the second stage of the asset condition works is approved, and it is recommended that this be funded loan funds as indicated in the Long-Term Plan. No options on this matter are presented as it is a requirement to undertake this work to progress the WSDP.

Work to address some of the other matters is also underway. An external supplier has been engaged to work with our new Assets Planning Team (established as part of Transformation to improve and develop our asset planning approach and capability) to complete an Asset Management Maturity Assessment. This updated assessment is expected to be completed by the end of February 2026.

The compliance issues Council faces and the action being taken to address these issues were outlined in the 25 November workshop. The information provided was not new and reflects the Council's ongoing analysis and investment planning over recent years to deal with historical underinvestment and non-compliance building on the information provided previously at various stages including i) the Council's enhanced three waters investment programme agreed in 2021; ii) the Otago-Southland analysis of 2024; iii) the Southern Water analysis of 2025 and; iv) the analysis and investment plan set out in the LTP 2025 and Water Services Delivery Plan.

The projects to address the compliance matters are funded through the LTP and set out in the WSDP. Therefore, no further decisions are required at this time. The capacity of Council, the wider sector and contracting industries to deliver what is set out in the LTP and the WSDPs is both a local and national issue and will be addressed in a subsequent report.

The last issue raised and the subject of the balance of the report is whether Council continues with an in-house service delivery model or it explores alternate models, as encouraged by both the Secretary for Local Government and the Minister.

Priority and Strategic Context

This matter is both important and urgent. Any delays in decision making will most likely result in failing to meet the deadline of delivering a revised WSDP. It will also create serious issue with developing the 2026/27 Annual Plan and preparing the organisation for which ever water services option is finally agreed and approved. In terms of the latter, most councils are now operationalising their WSDPs with a view to be up and running by the end of June 2027. They envisage a significant programme of work and dedicated resource over the next two to three years to achieve this. Whatever route Council chooses, it will have less time to operationalise its plan which will bring pressure on resources and the ability to deliver other priorities. Determining a way forward is urgent.

Analysis and Discussion

It is clearly stated in the feedback in both the communications from the Minister of Local Government and the Secretary Local Government that Council should explore alternate delivery options before resubmitting the WSDP. Council had already explored options as part of the WSDP development including membership of Otago based grouping, Southern Water Done Well (now Southern Waters) and a South Canterbury based group. Information was presented on these options in the 8 July Report. The key matters to consider now are whether Council wishes to reopen this discussion and, if so, which arrangements it wants to reconsider and what further information is needed that can be produced in given time and resource constraints.

At this stage, it is not considered practical to look at new partnership options that have not been considered previously. Most councils have now had their WSDPs approved and are focussed on operationalising arrangements and therefore, given the time and resource constraints, are unlikely to want to open up new options previously not considered. Experience of working on Southern Water Done Well and South Canterbury shows there is a lot of analysis and matters to consider that take months of work of substantial teams. Opening up completely new options

would be high risk including the risk of not meeting the timetable to submit a revised WSDP set out by the Secretary for Local Government.

The table that was included in the July decision report has been summarised and updated to assist with considering this matter. This is provided as attachment 4. This table will be referenced in the consideration of options section rather than discussed in this section of the report however it does need to be noted that there is currently more information available on the Southern Water option which makes some comparisons difficult.

It is recognised that part of the decisions made on 24 August was a requirement to explore potential collaborations.

RESOLVED WDC 2025/088

Moved: Cr Jim Thomson

Seconded: Cr Tim Blackler

Notes the willingness of the Council to explore future opportunities for collaboration with other Councils in relation to water services delivery.

CARRIED

To date the only exploration that has occurred as been at an informal level. This lack of progress is a direct result of the need to complete the various WSDP and more importantly, the uncertainty created by the WSDP assessment and approval process. This report is the first practical opportunity to consider this matter.

The recent Government announcement that it intends to replace regional councils with an alternate arrangement has further complicated an already challenging set of decisions as well as adding a further consideration to what route the Council may wish to go. However, given how recently this announcement was made and the lack of detail this issue is not examined at this time, but it is worth noting that with the proposals for reorganising local government, together with RMA reform and Building reform, there is a strong direction towards councils collaborating on a range of issues and services, not just water.

Consultation and Option Development

As this matter has been the subject of two separate consultation exercises no further consultation is required.

Financial Considerations

As this is only a decision on which options to explore there are no significant financial considerations. These will be a key consideration in subsequent reports.

Risks

Various matters in relation to water services are currently assessed as the highest risk matter Council needs to consider. Decisions and actions on this matter is the only path available to start mitigating this risk.

Significance and Engagement

Although the individual decisions are not significant, it must be understood that failure to take action in relation to the rejection of the WSDP and appointment of a Water Facilitator is highly likely to result in a greater level of intervention from the Minister of Local Government which would be highly significant.

Summary of Options Considered – Alternative Delivery Methods

Option 1 – Continue with In-house service delivery

Option 2 – Investigate the option to rejoin Southern Water only.

Option 3 – Investigate a Timaru / Waitaki option and conditions to join only.

Option 4 – Investigate both Timaru / Waitaki and Southern Water service delivery options to allow a more direct comparison of the potential benefits and risks. (preferred)

Assessment of Preferred Option

Based on the information that is currently available, it is difficult to make a direct comparison between the two primary options. It is therefore recommended that further investigation is undertaken to allow this comparison to occur. This will primarily focus on the Timaru / Waitaki option as this specific grouping has not been investigated or modelled in any substantive way as the prior work had included both Mackenzie and Waimate. This option does have risks, especially in terms of deliverability, however it is also most in line with the prior Council decision noted earlier in the report.

Another key factor to consider is the level of change being driven by Government. As two critical reforms have only just been announced, how these impact on the two options will need to be explored.

Continuation of the in-house delivery model is not recommended as it is not considered that this approach will produce a WSDP that will be approved when resubmitted. The basis of this opinion is the feedback that has been received, from the government. The key feedback received is that the model does not address concerns in relation to the compliance issues in a timely manner or with the confidence that the capacity, both internally and externally, to deliver what is proposed in the plan, will be able to be put in place. Although officers do not accept this view, currently there is no understanding of what information could be provided to address these concerns. If the expectation is that these matters are resolved or there are contractual arrangements in place to resolve them then this cannot be achieved in the time available.

Investigating the option to rejoin Southern Water is the simplest option as it is the one that is most well understood and has the greatest level of information available. This is a result of it being the preferred option for a period of time and was therefore the most developed. It is recognised that this option received limited support during the consultation period.

The key features of this arrangement are well understood as these were documented in the commitment agreement signed by the four Councils. This greater level of information is reflected in attachment four where there is a greater discussion of the benefits and risks. These arrangements were further clarified as the proposal was developed and formed the basis of the Southern Water WSDP that has been approved. It should also be noted that the approved WSDP specifically allows both Waitaki and Timaru to join the grouping. Southern Water has continued to develop and is at the stage of finalising key governance documents and other establishment decisions. What will need to be investigated are what re-entry conditions will apply and whether any previously agreed conditions have changed.

This is considered to be the lowest risk option in terms of use of Council's capacity, whilst there would still be significant work to do, given the progress, this option places the least burden on council's resources.

The third option is to explore a joint arrangement with Timaru District Council (Timaru). The Timaru approved WSDP is based around a stand-alone CCO to deliver water services. This plan does note an openness to working with others and potentially other delivery arrangement but does not provide any detail as to how and who.

The work to develop a joint CCO proposal between the South Canterbury Councils was not as well advanced as the SWDW grouping. The basis of this work was a four Council arrangement. As this is no longer the proposed arrangement some of this work will need to be updated and then developed further. This makes comparison to the Southern Water model at this point is difficult and there would be a lot of work to do in a short space of time to develop the proposal to enable a full comparison.

The Timaru WSDP has a deadline of 31 March for any joint arrangement to be finalised. Given the starting position, the level of effort required by both Councils and the time and resources available, it has been assessed that there is doubt that this deadline can be achieved and this poses a risk to this Council in terms of producing a compliant WSDP by the deadline. TDC does not face this risk given its WSDP is approved.

If Council did want to investigate this option further, it would require the urgent development of a Commitment Agreement in the approved DIA format by the two Councils. This would then form the basis of the negotiation of a more detailed agreement by the 31 March 2026 deadline. Both Councils would need to approve the commitment agreement no later than the first week of February 2026.

These are the only reasonably practical options that have been identified. It is the assessment of officers that there is no time or capacity to investigate and development other alternative delivery arrangements.

Next Steps

Should Council accept the recommendation it does need to be recognised there are significant other demands on capacity of the organisation (Governance and Officers). Previously the Chief Executive has highlighted the stretch on the council's resources from multiple competing priorities including transformation, a large capital programme and multiple reforms. Those pressures continue and the number of government reform initiatives is increasing. This will impact on the level of investigation that can be conducted and what information can be produced.

Whichever option is selected Council will need to urgently engage with the relevant entities and establish what role the Water Facilitator needs or wants to play. The aim will be to make a final decision of the service delivery model by the first week of February 2026 to allow time for the arrangement to be finalised by 31 March 2026 to then allow the preparation of an amended WSDP together with developing an Annual Plan that reflects the planned approach.

Other Matters

At its September meeting, the last Council resolved to establish a Future Water Services Advisory Group with some members drawn from the community. The focus of the group was to assist and advise Council on the implementation of the in-house business model and the development of its approach to successfully deliver its WSDP. However, with the rejection of the Council's in-house WSDP, it is unclear what role this group would play or whether this is the right time to appoint such a group. With the appointment of the Crown Facilitator, forming and developing this group may add an additional layer of complexity and it is unclear how this group would interact with the Crown Facilitator and what its' role would be given her powers and

responsibilities. Given workloads and the impact of the Christmas break officers are proposing to take no further action on establishing this group until after the next Council decision when the role this group can play will be clarified.

Water Services Delivery Plan Assessment

Assessment Report – Waitaki District Council

Te Kāwanatanga o Aotearoa
New Zealand Government

Internal Affairs
Te Tari Taiwhenua

Sensitivity: General

Glossary and abbreviations

The table below sets out the abbreviations used in this report

	Abbreviation
Capital expenditure	capex
Council-controlled organisation	CCO
Department of Internal Affairs	Department
Drinking Water Quality Assurance Rules	DWQAR
Funds from operations	FFO
In-house Business Unit	IBU
Infrastructure Decision Support	IDS
Levels of service	LOS
Local Government Funding Agency	LGFA
Local Government (Water Services Preliminary Arrangements) Act 2024	Preliminary Arrangements Act
Long-term plan	LTP
Southern Water Done Well	SWDW
Water services council-controlled organisation	WSCCO
Water services delivery plan	Plan
Waitaki District Council	WDC
Wastewater treatment plant	WWTP

Sensitivity: General

Assessment Cover Sheet

Background on council/s and engagement with the Department

Detail	Commentary
Councils involved in Plan	Waitaki District Council (WDC)
Number of connections	Water supply: 11,726 (8,500 residential and 3,226 non-residential) Wastewater: 8,413 (7,539 residential and 874 non-residential) Stormwater: 9,319 (7,917 residential and 1,402 non-residential)

Sensitivity: General

Detail	Commentary
DIA comment on council engagement during Plan development process	• Following the enactment of the Preliminary Arrangements Act, WDC (alongside Central Otago, Clutha and Buller District Councils) initially undertook modelling led by Selwyn District Council to investigate the benefits of a joint WSCCO, first with 11, then with five councils. • A working group was then tasked with assessing the merits of a regional Southland-Otago grouping consisting of Invercargill, Southland, Gore, Clutha, Dunedin, Central Otago, Waitaki and Queenstown-Lakes councils and providing advice to elected members. The report from the group indicated there are significant benefits to regional aggregation, particularly for the smaller, rural councils. • On 27 January 2025, the Department attended a meeting with Chief Executives from Central Otago, Clutha, Gore and WDC to discuss pursuing a joint model. A governance framework was put in place to advance the option and a request for support from the Department was requested due to lack of funding. • By mid-March 2025, WDC (alongside Clutha, Central Otago, Gore and Timaru District Councils) had signed a commitment agreement to work together towards a joint WSCCO (known as SWDW). The modelling for the SWDW group indicated modest benefits by 2034 for WDC from joining SWDW. • Ahead of consultation, the Department provided the grouping (which at the time included WDC) with a benchmarking tool to enable these councils to compare expected prices with other similar sized councils across the country. The use of the benchmarking tool by WDC indicated that the inhouse delivery model would result in average water services bills per connection, and operating expenses per connection that were lower than the national average. • WDC consulted on SWDW as its proposed delivery model and 54% of submitters identified an In-house Business Unit as their preferred delivery model, with only 15% identifying that their preferred model was SWDW. • On 8 July 2025, WDC resolved to withdraw from SWDW and pursue an in-house business model. This required remodelling of the draft Plan.
Feedback provided to council prior to submission on Draft Plan	• On 18 July 2025 the Department formally requested that WDC provide a draft WSDP to it by 31 July 2025. WDC provided the Department with a draft Plan for review on 31 July 2025. • The Department responded on 11 August 2025 with significant feedback stating that from the assessment of the draft, the Department's view was that the draft Plan did not comply with the legislative requirements. • On 13 August 2025, the Department met with WDC elected members to discuss the feedback on the draft Plan. This included outlining each point of feedback, communicating that the draft Plan did not meet requirements in its current state and that significant further work was required. The Department also reminded WDC of the potential for Crown intervention under the Preliminary Arrangements Act. • WDC responded to the Department by submitting its final WSDP on 28 August 2025.

Sensitivity: General

Detail	Commentary
Engagement with council during review and assessment process	On 9 September 2025, the Department emailed WDC with queries in relation to the following matters: • A significant increase in charges for consumers, particularly in the first few years of the Plan; • The basis/methodology used to develop the investment plan to support the delivery of water services, given the lack of condition rating; • Capex funding allocated for the Oamaru supply pipeline (circa 1880) in the investment plan; • Noting that the Oamaru supply pipeline is at the end of its theoretical life and that it is identified as a critical asset, further information on what performance/condition monitoring will be undertaken by the council to assess its condition and remaining useful life; and • The current quantity/value of network asset renewals backlog and the period over which this is expected to be renewed as graphs included in the plan are unclear. On 12 September 2025, WDC Chief Executive Alex Parmley confirmed the investment plan for water supply network renewals is based on the modified useful life of the assets, which takes into account the age, material, and criticality of the pipes. The planned investment is in line with modelling done by IDS in March 2024 which looked at a range of investment scenarios for the water supply network. WDC provided detailed information from WSP (an engineering consultancy) on the condition of the Oamaru water supply pipeline and renewal profile and also explained the backlog of renewals. The Plan signals that there are projects in place to address compliance issues, as well as the installation of water meters which will address high water loss and usage. On 15 September 2025, the Department asked if there was a report provided as part of the IDS modeling that could be reviewed as supplementary information in the context of further information on the wastewater network WDC responded that the IDS modelling was for watermains and provided an interim report on Oamaru wastewater renewals strategy which focuses on the earthenware pipes in Oamaru, which represents approximately 15% of the wastewater network. The information request covered all aspects of the water services network, including drinking water, wastewater and storm water, no information was provided on the stormwater network. Additionally, on 12 September 2025, the Mayors of WDC and Timaru District Council wrote to the Minister for Local Government noting that councils are beginning exploratory discussions on how they might collaborate to improve efficiency and reduce costs. While no decisions have yet been made, the Mayors noted that a more formal arrangement could be an option in the future, potentially with the inclusion of other neighbouring councils.
Other Background Comments	WDC has previously indicated it could redirect $650,000 of its remaining and uncommitted Better off Funding balance, currently $1.9m, to water projects.

Sensitivity: General

Assessment Summary

Section	Commentary
Confirmation of submission completeness checklist	All sections of the Plan completed, however noting that a plan for obtaining a detailed asset condition has been included instead of the information itself. Following a request for clarification, WDC provided some additional information to support the asset condition assessment.
General Comment on Plan	WDC is proposing an IBU model. The primary issue identified relates to the provision of an asset condition assessment. Under section 13(1)(h) of the Preliminary Arrangements Act, all plans are required to include "*an assessment of the current condition, lifespan, and value of the water services networks*" The initial Plan provided by WDC did not include a sufficient asset condition assessment as required under the Preliminary Arrangements Act. The Department requested additional information from WDC during the assessment phase. WDC were able to provide some additional information regarding modelling undertaken in 2024. The information provided did not cover all of the water services network, and accordingly the ability to assess financial projections and investment sufficiency remains limited. If the asset condition is worse than assumed, this may impact the assessment of the sufficiency of the capital investment programme to meet the relevant regulatory requirements and standards. The plan notes that a conservative approach has been taken to the prioritisation of investments. The Plan notes that a conservative approach has been taken in their financial modelling and prioritisation of capital investments. More information on this specific issue is included in the "Issues for discussion with Panel" section, and in the relevant sections in Part B and Part D of the assessment. The following additional matters were identified through the assessment. In isolation from the above issue, these matters do not prevent the Plan from meeting the legislative requirements. However, they should be monitored through implementation: • The investment plan is double compared to previous delivery levels, which is considered a risk; • Limited information was provided on WDC's approach to asset management and we note a s17A review of service delivery under the Local Government Act 2002 is planned for 2027; • The Plan assumes WDC will obtain a credit rating to allow it to increase its borrowing limit from 175% to 280% with LGFA. The implementation plan provides a timeline for obtaining such a credit rating; and • The average projected charges for water services increase from $1,468 to $3,465. Price increases fluctuate over 10 years with the most significant increase of 62.4% in 2026/27.

Sensitivity: General

Section	Commentary
Financial Sustainability Comment	As noted earlier, the concerns regarding asset condition raised earlier in this report mean that it is challenging to confirm the level of investment is sufficient, which impacts the overall assessment of the financial sustainability of the Plan.
Revenue Sufficiency	The revenue in the Plan is sufficient to cover the costs of delivering water services including delivery of the capital investments outlined in the Plan. If planned capital investment has been understated additional revenue will be required which may impact this assessment. There are projected operating cash surpluses for water services in every year of the Plan and projected operating deficit ranges between negative 27.4% and positive 7.9% over the 10 years, mainly due to fully funding depreciation. The average projected charges for water service increase from $1,468 to $3,465. Price increases fluctuate over 10 years with the most significant increase of 62.4% in 2026/27. We recommend the proposed pricing pathway and affordability are monitored during implementation.
Investment Sufficiency	Subject to the above concern regarding asset condition information, the proposed investments are sufficient to meet the LOS, regulatory requirements and renewals, however the Department notes that limited funding is provided for growth. WDC confirmed the investment plan for network renewals is based on the modified useful life of the assets, which takes into account the age, material, and criticality of the pipes. The planned investment is in line with modelling done by IDS in March 2024 which looked at a range of investment scenarios for the water supply network. The asset consumption ratio is increasing which indicates that the planned renewals investment will result in an increase in the average age of assets in the network.
Financing Sufficiency	Projected borrowings for water services increase from $56.9m to $200.8m and stays below 500% net debt to operating revenue ratio throughout the 10-year period. There is headroom in the Plan, however in 2033/34 it is only $500,000 so we expect that this would be a matter for consideration by the governance committee for three waters service delivery. WDC water services operate with positive FFO throughout the Plan and range from 2% to 11.1%. The Plan confirms that projected whole of council borrowings will remain within LGFA borrowing limits and assumes WDC will obtain a credit rating to allow it to increase the borrowing limit from 175% to 280% with LGFA. We recommend that WDC work closely with rating agencies and LGFA to achieve a rating and the Department monitor receipt of this during implementation.
Overall assessment recommendation	The overall recommendation from the assessment phase is to **discuss** the outcome of the assessment with the Panel.

Sensitivity: General

Issues for discussion with Panel

Issue	Description	Recommended treatment
Asset condition	The Plan as originally submitted to the Department did not include a sufficient asset condition assessment as required under the Act. Further information was sought from WDC on asset condition. On 12 September, WDC confirmed the investment plan for water supply network renewals is based on the modified useful life of the assets, which takes into account the age, material, and criticality of the pipes. The planned investment is in line with modelling done by IDS in March 2024 which looked at a range of investment scenarios for the water supply network. On 15 September additional information on wastewater renewals for earthenware pipes (15% of the network) was provided by WDC. No information was provided on the stormwater network. The supporting information from WDC stated that renewal backlogs will be managed and will be resolved by 2039 (noting the potential impact on the Omaru water supply renewal forecast). The supplementary information does not fully address or respond to the lack of condition information for large parts of the water services network. Investment in renewals is 11% greater than depreciation of the network. At an activity level, wastewater is 100% more than depreciation, while water is 33% lower than depreciation and stormwater is 33% lower than depreciation. The asset consumption ratio increases, from 62.7% to 69%, which indicates that the planned renewals investment will result in an increase in the average age of assets in the network.	Discuss proposed approach with Panel to consider if the level of information provided is sufficient to meet requirements. If the conclusion of the assessment is that insufficient information has been provided on the condition of the assets, then the assessment may not be satisfied that the content requirements under section 13 (1) (h) of the Preliminary Arrangements Act have been met.
Growth funding	The plan notes a 10% population increase over ten years. The WSDP references a number of projects that are listed as having a primary driver of level of service improvement will also address capacity issues in the network. Growth projects in the plan are limited to network extensions to provide services to areas not currently connected. WDC has prioritised its capital programme with priority given to compliance related improvements and renewals. Water supply and wastewater network extension capital projects have been categorised as “should do”.	Discuss proposed approach with Panel to consider if the level of growth funding is sufficient to meet requirements.

Sensitivity: General

Issue	Description	Recommended treatment
Delivery of investment plan	Historical delivery indicates an average of $10-12m per annum over the last 6 years whereas the Plan requires a step up to an average of $26m per annum for the first eight years, and $46m- $51m in the final two years. Delivery is acknowledged as mixed, with the Plan indicating this is being addressed with a Project Management Office established. There is supporting information provided on improved resourcing to support delivery.	We recommend monitoring the capex delivery programme during implementation.
Asset management approach	Limited information was provided on WDC's approach to asset management. We note a S17A review of service delivery under the Local Government Act 2002 is planned for 2027.	We recommend monitoring of WDC's asset management approach.
Credit rating	The Plan assumes WDC will obtain a credit rating to allow it to increase its borrowing limit from 175% to 280% with LGFA.	We recommend that WDC works closely with rating agencies and LGFA to achieve this a credit rating. We recommend monitoring the receipt of a credit rating during implementation as this is needed for WDC to secure the required lending.
Pricing and affordability	The average projected charges for water service increase from $1,468 to $3,465. Price increases fluctuate over 10 years with the most significant increase of 62.4% in 2026/27.	We recommend the proposed pricing pathway and affordability are monitored during implementation.

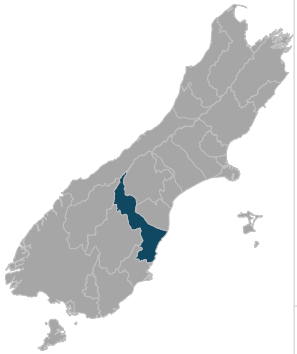
Sensitivity: General

Water Services Delivery Plan Summary Analysis – Waitaki District Council - IBU

IN CONFIDENCE

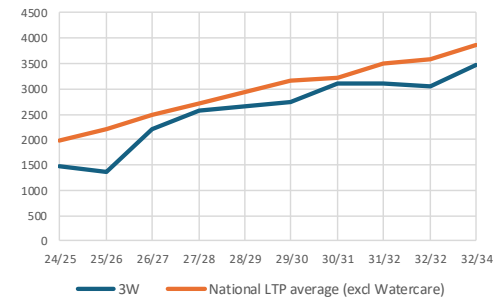
Council summary information

Summary information	Level
Current population	24,934
Drinking water connectio	11,975
Wastewater connections	8,347
Stormwater connections	9,367
High growth council	No
10 year population growth	10.1%



Affordability and growth

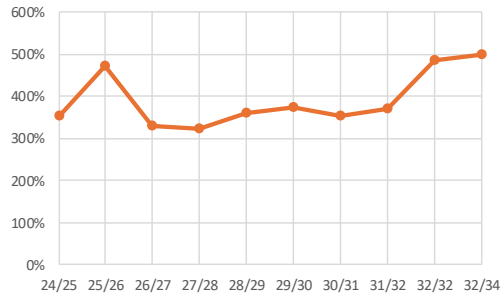
Water services charge compare to national LTP average



Item	Year 1	Year 10	10 Year Average
Total charge as % of median income	1.90%	3.70%	2.98%
Annual price increase	22.10%	14.10%	12.54%
DC collected per new connection ($)	N/A	N/A	3,125

Financing

Net debt to operating revenue



Item	Year 1	Year 10	10 Year Average
Water related net debt to operating revenue %	354%	499%	392%
FFO to debt	6.1%	7.9%	8.2%
Whole of Council net debt to revenue (approximately)	160%	200%	180%

Assets, network and compliance

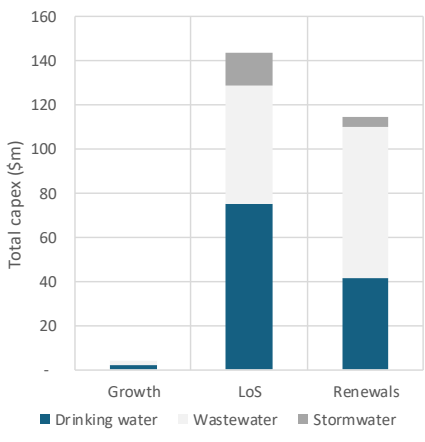
Asset measures	Year 1	Year 10	10 Year Average
Total assets per connection ($)	13,301	22,849	17,718
Total debt per connection ($)	1,898	8,493	4,370
Operating costs per connection ($)	289	335	344
Age of network (years)	**DW**	**WW**	**SW**
Average age outlined in plan	33	54	54

Network performance	Level
Level of service performance measures achieved	73%
Water loss rate	38.8%
Average consumption (litres per person per day)	532

Compliance addressed in the Plan	
Drinking water compliance	Yes
Resource consent compliance	Yes

Capital expenditure	Category of capital expenditure			Total over 10 years
	Growth	Level of service	Renewals	
Drinking water	1,993	75,342	41,465	118,800
Wastewater	1,993	53,253	68,931	124,177
Stormwater	-	14,993	4,247	19,240
Total 10 years	**3,986**	**128,595**	**110,396**	**242,977**

Capex spend by type, 10 year total



IN CONFIDENCE

Assessment Report: Part A – Statement of financial sustainability, delivery model, implementation plan and assurance

Section in Part A	Summary of content in Plan	Assessment Review Comment	Assessment	Focus for panel
Delivery model and implementation				
Financially sustainable water services provision	Includes a statement that WDC confirm the Plan sets out a path for financially sustainable three waters services, noting that: • Investment in three waters services is sufficient to address known and anticipated compliance standards; • Revenue is sufficient to cover all operating cost from the 2027 to 2028 financial year onwards; and • Financing is sufficient to support investment in the overall capital programme. WDC recognises that access to financing assumes that WDC will be able to obtain a credit rating. Initial discussions indicate this is achievable.	The Plan may be financially sustainable, as the projected revenue is sufficient to ensure the long-term investment in delivering water services and the level of investment is sufficient. However, this is subject to the above concern relating to information provided on asset condition) to meet LOS and regulatory requirements. We also note that limited funding has been included for growth. The Plan assumes WDC will obtain a credit rating to allow it to increase its borrowing limit from 175% to 280% with LGFA. We recommend that WDC works closely with rating agencies and LGFA to achieve a rating and this is monitored during implementation.	Meets requirements subject to discussion on asset condition assessment and growth	N/A
The proposed model to deliver water services	The IBU model includes changes to financial systems, reporting, governance arrangements and organisational structure, as indicated in the implementation plan. The IBU model utilises the ability for Council to leverage its lending across its entire operating revenue, allowing total three waters borrowing at levels consistent with (or slightly higher than) the alternative model of a standalone organisation.	The Plan's description of the proposed IBU model is clear with implementation occurring from 2025 to July 2027. The IBU model includes changes to the organisational structure within WDC including appointment of an independent water committee to monitor performance The IBU will meet ringfencing requirements.	Meets requirements	N/A

Sensitivity: General

Section in Part A	Summary of content in Plan	Assessment Review Comment	Assessment	Focus for panel
Implementing the proposed service delivery model	The IBU will be implemented over the next two financial years. Initial steps are: • Commence work on an amendment to WDC's existing 2025 – 2034 LTP; • Incorporate budgeting changes to achieve a balanced budget at a whole of council level; and • Commence scoping work on the establishment of a new ledger and reporting requirements. Steps to be taken during 2026/27: • Review of existing corporate overhead allocation approach to ensure fairness and transparency and ensure that overhead allocations can be justified; • Implement a time-sheeting system to ensure that all time related to three waters service delivery is appropriately recorded and costed; • Work with the newly elected council to determine the appropriate governance arrangements and delegations; • Review WDC's revenue and financing policy with a with a view to separating the roading and stormwater targeted rates from 1 July 2027; • Complete organisational design to identify changes to the service delivery structure and reporting lines/responsibilities for new senior leadership role; • Recruitment process to appoint independent members for the new governance body from 1 July 2027; • Commission new ledger system for three waters; • Recruit for a new senior leader to enable appointment by 1 July 2027; and • Prepare water services strategy and 2027-2037 LTP. • Steps to be taken during 2027/28 or 2028/29: • Undertake work to obtain a credit rating to access increased levels of borrowing.	Information provided in the implementation plan is sufficient to meet the requirements of section 13(2) of the Preliminary Arrangements Act.	Meets requirements	N/A

Sensitivity: General

Section in Part A	Summary of content in Plan	Assessment Review Comment	Assessment	Focus for panel
Consultation and engagement undertaken	Public consultation was undertaken between 6 May and 9 June 2025. Consultation sought feedback on four options including a joint WSCCO with Central Otago District Council, Clutha District Council, and Gore District Council (SWDW), a standalone WSCCO, an IBU, and a joint WSCCO with Canterbury councils. In the consultation, the SWDW option was the proposed delivery model. WDC received a total of 300 submissions from individuals, organisations, and community groups. The IBU received the majority of support from submitters (54% of "first choice" selections), followed by the standalone WSCCO (21%) and the SWDW option (15%).	Consultation meets the requirements of the Preliminary Arrangements Act. The number of submissions represents approximately 1.2% of the population in the district.	Meets requirements	N/A
Assurance and adoption of the Plan				
Council resolution to adopt the Plan	Water services delivery plan adopted 26 August 2025.	N/A	Meets requirements	N/A
Certification of the Chief Executive of Waitaki District Council	Water services delivery plan certified 27 August 2025.	N/A	Meets requirements	N/A

Assessment Report: Part B – Network Performance

Section in Part B	Summary of content in Plan	Assessment Review Comment	Assessment	Focus for panel
Investment required in water services				
Serviced population and serviced areas	WDC is responsible for managing: • 15 domestic water supplies serving a population of 25,100; • Eight wastewater schemes serving a population of 16,430; and • Eight community areas with stormwater systems. Four of these are substantial. An 11.9% growth in household units is expected over the 10-year period. In 2023/24 performance measures were met for: • Five of nine drinking water measures; • Four of five wastewater measures; and • All five stormwater measures.	Note that in this section population served is listed as 25,100 and on Page 29 of the Plan the FY 2024/25 population served is listed as 24,934. Sufficient information provided on service areas, connections and growth. In FY 2023/24, 73% of performance measures were met.	Meets requirements	N/A
Assessment of the current condition and lifespan of the water services network	Assets have an average age of 32 to 54 years. A condition improvement programme plan has been included to improve data and move to a proactive management approach. **Water supply**	See earlier section regarding asset condition assessment for additional context.	For discussion with the Panel. As presented the plan may not meet the requirements of Section 13(1)(h) of the Preliminary Arrangements Act.	Yes

Sensitivity: General

Section in Part B	Summary of content in Plan	Assessment Review Comment	Assessment	Focus for panel
	The Plan indicates that the water supply network is on average 33 years old, with the oldest pipes being 1880 cast iron pipes. Assessments of the cast iron gravity mains indicate condition is fair and external advice is that it does not need to be replaced in the short term. WDC continues to monitor this and notes the Oamaru watermains are at the end of theoretical useful life, but failure rates are low. Funding has been allocated for further condition assessment, particularly for the Oamaru cast iron watermains. The Plan states that watermain failure data is used to analyse timely renewals to ensure unplanned interruptions are within an acceptable level. **Wastewater** The Plan indicates high inflow and infiltration into the wastewater network and budget has been allocated for investigation work. The Plan notes that approximately 7km of the wastewater system was surveyed by CCTV in the past five years. Recent inspections indicate a general deterioration of the network condition. **Stormwater** The Plan indicates the stormwater network is on average 54 years old, is not considered old and is some way from reaching the end of its useful life. The Plan states investment is required for upgrades, and budget for scoping is provided.	On 9 September 2025, the Department sought further clarification from WDC on the basis/methodology for how they developed the investment plan to support the delivery of water services. WDC confirmed the investment plan for network renewals is based on the modified useful life of the assets, which takes into account the age, material, and criticality of the pipes. The planned investment is in line with modelling done by IDS in March 2024 which looked at a range of investment scenarios for the water supply network. WDC provided detailed information from WSP on the condition of the Oamaru water supply pipeline and renewal profile and also explained the backlog of renewals. The Plan signals that there are projects in place to address compliance issues, as well as the installation of water meters which will address high water loss and usage. Additional notes from assessment of information provided: **Water supply** • Supplementary information has been provided on the Oamaru cast iron watermains which concludes that the useful life has been extended to 150 years (2033) but there is no apparent urgency to begin renewal of these highly critical assets, preferring instead to reassess condition over the next 5-10 years; and • Water renewals backlog is $9.15m, expected to be cleared by 2039. Note that any potential decisions by WDC to formally extend the useful life of the cast iron mains in Oamaru would have a significant impact on the shape of the renewal curve and the size of the backlog. **Wastewater**		

Sensitivity: General

Section in Part B	Summary of content in Plan	Assessment Review Comment	Assessment	Focus for panel
		• Inflow and infiltration into the wastewater network indicates deterioration in the network. We note renewals funding has been provided for the wastewater network; and • Wastewater renewals backlog is $18.86m, expected to be cleared by 2033. **Stormwater** • There has been no funding for stormwater from 2018-2024, although actual spend has occurred indicating that funding is required; • The Plan provides for stormwater renewals and upgrades over the 10-year period; and • Stormwater renewals backlog is $0.58m, backlog is insignificant and will be cleared by 2028. On 15 September 2025, the Department asked if there was a report provided as part of the IDS modeling that can be reviewed as supplementary information. WDC responded that the IDS modelling was for watermains and provided an interim report on Oamaru wastewater renewals strategy which focuses on the earthenware pipes in Oamaru which represents approximately 15% of the wastewater network. The supplementary information does not fully address or respond to the lack of condition information for the majority of the network and thereby may not provide sufficient base information to support the renewals investment in the Plan.		
Asset management approach	WDC retains responsibility for asset planning, while operations and maintenance are carried out by a contracted service provider.	Limited information provided on asset management approach, and limited commentary is provided on how asset management will support the proposed model.	Meets requirements.	Yes

Sensitivity: General

Section in Part B	Summary of content in Plan	Assessment Review Comment	Assessment	Focus for panel
	Under the IBU, it is expected that the current contracted out services will continue, pending a Local Government Act 2002 section 17A review in 2027, which will consider whether the treatment of water and wastewater is best undertaken externally or internally. Asset maturity assessment from 2017 highlighted a number of areas for improvement.	While areas for improvement are highlighted in the asset maturity assessment, no subsequent action plan has been identified. Maturity assessment highlights areas of focus and expected improvements. There is little change in delivery mechanisms proposed in the Plan. This indicates that WDC will review these arrangements in 2027 as part of a S17A service delivery review. We recommend monitoring of WDC's asset management approach, noting the s17A review planned for 2027.		
Statement of regulatory compliance – Drinking water	Three of WDC's 15 water supplies were compliant with the DWQAR at the end of Quarter 2 2024/25. There are various capital upgrades underway to ensure compliance with Drinking Water Standards. This includes UV upgrades at four sites and installing filters at Otematata. To manage water loss WDC is shifting its water demand management approach from its historic focus on fixing leaks reactively to a proactive management approach. The Plan indicates installation of water meters in 2027/28 - 2029/30 will address usage and water loss. $12M is allocated in significant projects.	There are projects in place to address non-compliance with DWQAR. WDC has indicated all supplies will be compliant by 2026/27.	Meets requirements	N/A
Statement of regulatory compliance - resource consents	The Plan notes WDC has 14 water take consents, 13 wastewater discharge consents and 1 stormwater consent. There are five current active consent applications. 11 consents expire in the next 10 years. The Plan provides a description of non-compliance issues and solutions.	The abatement notice has been explained and the issue rectified. There are projects listed in the significant projects section to address WWTP compliance issues.	Meets requirements	N/A

Sensitivity: General

Section in Part B	Summary of content in Plan	Assessment Review Comment	Assessment	Focus for panel
	One infringement notice for breach of an abatement notice was issued in 2023, and there were abatement notices for the Oamaru WWTP not captured in the 2023/24 Annual Report.			
Capital expenditure required to deliver water services and ensure that water services comply with regulatory requirements	The Plan summarises WDC's projected 10-year capital investment forecast. Capital investment is planned to address identified network performance issues. WDC is shifting from historical reactive management to a proactive management approach. Total expenditure varies from $51m (2032/33) to 15.5m (2025/26).	Total annual capex varies from $15.5m (2025/26) to $51m (2032/33). The Plan mentions a prioritisation process to identify a financially sustainable capital programme, but details are limited. Growth funding for drinking water and wastewater is limited in the plan; however, the plan also states that there are LoS projects that will also have a growth component. There is no funding allocated in the plan for stormwater growth. Priority investment is in drinking water LOS improvements and renewals.	For discussion with panel	Yes
Historical delivery against planned investment	Total delivery for drinking water was 102% against plan for 2021/22 – 2023/24. Total delivery for wastewater was 80% against plan for 2021/22 – 2023/24. Stormwater capex spend is unbudgeted.	History indicates water asset delivery of $10-12m per annum over the last 6 years whereas the Plan requires a step up to average $26m per annum across the Plan, and $46m- $51m in the final two years. Delivery is acknowledged as mixed with the Plan indicating this is being addressed with a Project Management Office established. There is supporting information provided on improved resourcing to support delivery. We recommend that delivery of the capital programme is monitored through implementation.	Meets requirements	Yes

Sensitivity: General

Assessment Report: Part C – Revenue and financing arrangements

Section in Part C	Summary of content in Plan	Assessment Review Comment	Assessment	Focus for panel
Revenue and charging arrangements				
Charging and billing arrangements	Current charges for water, wastewater, and stormwater are outlined in the Plan. A separate stormwater rate will be introduced in 2027/28 to maintain ringfencing. To ensure financial sustainability and meet ringfencing needs: • Revenue and costs will remain funded through a targeted rate and directly allocated, with a new three waters ledger for better transparency. • Overhead allocation will be reviewed for fairness. • Funding is set aside for system improvements to support separate three waters reporting. • Extra provisions will strengthen accountability and governance for three waters. Additional resources are allocated for increased reporting and compliance.	Charging and billing arrangement are outlined in the Plan.	Meets requirements	N/A
Water services revenue requirements and sources	Revenue comes from targeted property rates, with additional income from fees, charges, and development contributions as projected in WDC's 2025-2034 LTP. The development contributions policy will be regularly reviewed. WDC may also use other funding tools like development levies and targeted rates when available.	The Plan provides sufficient detail on the water services revenue requirements and sources.	Meets requirements	N/A
Existing and projected commercial and industrial users' charges	Projected three waters charges rise 136%, from $1,468 to $3,465 on a combined basis across all connections. No analysis has been completed for the impact of price increases on commercial customers as commercial customers typically pay a volumetric charge based on their water usage. Currently, residential rates provide 63% of drinking water, 75% of wastewater, and 72% of stormwater funding. There is scope to rebalance some water charges across trade waste and non-residential connections. The introduction of volumetric charging may change these proportions.	Existing and projected commercial and industrial users' charges have been outlined in the Plan.	Meets requirements	N/A

Sensitivity: General

Section in Part C	Summary of content in Plan	Assessment Review Comment	Assessment	Focus for panel
The affordability of projected water services charges for communities	Water charges in Waitaki District are set to rise on a composite basis across all connections from 1.7% to 3.7% of median household income between 2026 and 2034, raising affordability concerns. A shift to volumetric pricing may help single-person households but could mean higher charges for large water users.	The affordability of projected water services rises above 3.1% of median household income from 2027/28. We recommend that affordability is monitored during implementation.	Meets requirements	Yes
Funding and financing arrangements				
Water services financing requirements and sources	Three waters borrowing rises from $56m in 2024/25 to $201m by 2033/34. Borrowing will use a mix of fixed/floating rates, short/long-term debentures, interest rate swaps for hedging, mainly from LGFA, and commercial paper as needed. WDC will need to obtain a credit rating and will also undertake a broader review of its whole of council financial performance and seek to achieve a balanced budget prior to applying for any credit rating. Key financial water funding strategies are: • Depreciation is fully funded. • Operating surpluses are used for asset renewal first. • Growth and service investments are funded are by debt, aligning costs with future users. • Development contributions are collected where possible. • Debenture stock is renewed unless enough cash reserves exist for repayment. • Debt is kept within limits; and revenue is raised as needed to support this, maximising leverage to lower water charges.	The Plan outlines the water services financing requirements and sources. We note that WDC will need to obtain a credit rating to allow it to increase its borrowing limit from 175% to 280% with LGFA and recommend that WDC works closely with rating agencies and LGFA to achieve this.	Meets requirements	Yes
Internal borrowing arrangements	WDC borrows externally at a whole of council level, with an internal treasury management function which allocates debt to relevant activities. All debt is backed with external borrowing. WDC has no internal lending arrangements between activities and does not propose to introduce any such arrangements.	WDC has no internal borrowing arrangements and does not intend to have any in the future.	Meets requirements	N/A

Sensitivity: General

Section in Part C	Summary of content in Plan	Assessment Review Comment	Assessment	Focus for panel
Determination of debt attributed to water services	WDC's three waters debt for the year ending 30 June 2023 was agreed with the National Transition Unit. Debt is allocated directly to three waters activities at a cost centre level and is fully traceable at a cost centre level, with no internal lending currently in place. Movement in debt balances, and the current assumed level of three waters debt, are based on these cost centre allocations and the opening position.	The determination of debt attributed to water services is stated in the Plan.	Meets requirements	N/A
Insurance arrangements	Three waters infrastructure was valued at $377.2m in 2023/24 ($263.9m in 2023). Assets over $1m and critical items are insured for $162.5m ($105.4m in 2023). WDC manages asset risk for the remaining assets via Local Authority Protection Programme membership, depreciation reserves, and the Disaster Fund. Total asset replacement cost is $612,341,794 at 30 June 2024: • Water Supply: $272,042,498; • Wastewater: $282,749,279; and • Stormwater: $57,550,017. WDC relies on the Government's risk sharing for essential infrastructure recovery, with Central Government covering 60% of damaged horizontal infrastructure costs after a natural disaster. WDC holds reserves for rapid response and uninsured losses: as at 30 June 2024, the Disaster Fund was $2,025,805 and the Insurance Excess Fund $203,094. Committed cash facilities are also in place for extra funding if needed.	Sufficient details on WDC's insurance arrangements are in the Plan.	Meets requirements	N/A

Sensitivity: General

Assessment Report: Part D – Financial sustainability assessment

Section in Part D	Summary of content in Plan	Assessment Review Comment	Assessment	Focus for panel
Financially sustainable water services provision				
Confirmation of financially sustainable delivery of water services by 30 June 2028	Operating revenue will cover all operating costs, including depreciation and finance, from 2027. Three waters aims for cash surpluses, not operating surpluses. Residential three waters charges will rise by 136% by 2034. The Plan allows $1m extra annual operating costs for governance, staff, levies, audit, and credit rating and costs of regulatory oversight. Total network investment exceeds depreciation; renewals investment is below depreciation due to asset age and new assets. Service investment also supports growth and asset replacement. Planned investment will lower the average asset age. All capital spending is fully funded by revenue or debt. Three waters debt stays under 500% of revenue before 2034.	As noted earlier, the concerns regarding asset condition and growth raised earlier in this report mean that it is not possible to confirm the level of investment is sufficient to meet LOS and regulatory requirements and recommend discussing this with the Panel.	For discussion with Panel	Yes
Actions required to achieve financially sustainable delivery of water services	To achieve financial sustainability, Council proposes to fully fund depreciation from 2026/27, increase operating expenditure for regulations and asset management and obtain a credit rating by 2027/28 or 2028/29. These steps will help WDC cover operating costs, renew assets, and service debt for three waters infrastructure, while ensuring access to debt for capital projects.	Actions required to achieve financially sustainable delivery of water services are outlined in the Plan.	Meets requirements	N/A

Sensitivity: General

Section in Part D	Summary of content in Plan	Assessment Review Comment	Assessment	Focus for panel
Risks and constraints to achieving financially sustainable delivery of water services	The Plan relies on a number of core assumptions and risks which may impact the future financial sustainability of three waters services. These are outlined below: • Ability to access debt and the need to obtain a credit rating to access increased lending at 280% of total revenue; • The risk that the capital programme is inadequate or under costed; • Interest rate and inflation assumptions; • Efficiencies arising through economic regulation and a shift to more proactive investment planning have not been factored into the financial projections; • Projected efficiencies from economic regulation and proactive planning are not included; if achieved, charges may be lower; • Affordability constraints; • Actions of the water services regulator; and • Actions of an economic regulator or the introduction of a rates cap that incorporates three waters.	Risks and constraints to achieving financially sustainable delivery of water services have been outlined in the Plan.	Meets requirements	N/A
Assessment of revenue sufficiency				
Projected water services revenues cover the projected costs of delivering water services	Operating revenue will cover operating costs, including depreciation and finance costs, from 2026/27. Three waters is not intended to generate an operating surplus but will have cash surpluses. Residential three waters charges rise by 136% by 2034. From 2026/27, three waters revenue will cover operating costs, achieving a balanced budget. The 2025/26 deficit is higher due to a loan-funded de-sludging project at Oamaru wastewater plant, counted as an operating cost.	Projected water services revenues cover the projected costs of delivering water services and are outlined in the Plan. Our assessment of revenue sufficiency has assumed that the revenue in the Plan is sufficient to deliver the capital investments outlined. If the capital programme requires amendment (because, for example, the information on asset condition on which it has been made is inadequate), then additional revenue may be required.	Meets requirements	N/A

Sensitivity: General

Section in Part D	Summary of content in Plan	Assessment Review Comment	Assessment	Focus for panel
Average projected charges for water services over 2024/25 to 2033/34	Projected household charges for three waters services at WDC are set to rise by 62% in 2026/27 and 136% by 2034. The average charge per connection is projected to increase from $1,468 to $3,465. The price changes start with a 22.1% increase, a 7.9% decrease in 2025/26 and a significant 62.4% increase in 2026/27. Year on year increases fluctuate through to 2033/34. WDC considered phased price increases for 2026/27 but decided on a single year rise due to uncertainties around future Commerce Commission pricing controls and potential rates caps. Delaying increases could affect financial sustainability, increase short-term lending needs, cause operating deficits, impact credit ratings, and raise future debt and borrowing costs. The proposed increase would bring charges close to the Ministry of Business, Innovation and Employment's estimated $195 monthly power cost.	The average projected charges for water service are outlined in the plan and increase from $1,468 to $3,465. Price increases fluctuate over 10 years with the most significant increase of 62.4% in 2026/27. We recommend the proposed pricing pathway is monitored during implementation.	Meets requirements	Yes
Projected operating surpluses/(deficits) for water services	From 2027/28, revenue is expected to break even, fully funding depreciation and renewals through depreciation recoveries. From 2031/32, extra revenue is included to meet lending covenants and reduce future borrowing costs. This leaves debt to fund new infrastructure for future consumers. The 2025/26 deficit arises due to a loan-funded de-sludging project at Oamaru wastewater plant, classified as an operational cost.	The projected operating deficit ranges between negative 27.4% and positive 7.9% over the 10 years mainly due to fully funding depreciation.	Meets requirements	N/A

Sensitivity: General

Section in Part D	Summary of content in Plan	Assessment Review Comment	Assessment	Focus for panel
Projected operating cash surpluses for water services	The projected operating cash surpluses for WDC's three waters under an IBU model has costs factored in for extra governance, new specialist staff, regulatory levies, and credit rating maintenance. Operating cash surpluses grow from approximately 21% of operating revenue to over 60% of operating revenue over the 10-year period.	There are projected operating cash surpluses for water services in every year of the 10-year Plan.	Meets requirements	N/A
Assessment of investment sufficiency				
Projected water services investment is sufficient to meet levels of service, regulatory requirements and provide for growth	Proposed investment in the network in total exceeds depreciation. While growth investment appears low, the Plan indicates a number of levels of service projects to also address growth issues, including: installation of water meters, capacity upgrades for the Lower Waitaki scheme, Oamaru Water Source Strategy investment, to improve security of water supply, leak detection and mains renewals programmes which will reduce water loss. On 9 and 15 September 2025, WDC confirmed the investment plan for water supply network renewals is based on the modified useful life of the assets, which takes into account the age, material, and criticality of the pipes. The planned investment is in line with modelling done by Infrastructure Decision Support in March 2024 which looked at a range of investment scenarios for the water supply network. Additional information on wastewater renewals for earthen ware pipes (15% of network) was provided by WDC. No information was provided on the stormwater network.	As noted earlier, the concerns regarding asset condition and growth raised earlier in this report mean that it is not possible to confirm the level of investment is sufficient to meet LOS, regulatory requirements and renewals and recommend discussing this with the Panel.	For discussion with panel	Yes

Sensitivity: General

Section in Part D	Summary of content in Plan	Assessment Review Comment	Assessment	Focus for panel
Renewals requirements for water services	Renewals investment exceeds depreciation and renewals backlogs are being effectively managed during the period and will be resolved by 2036. Asset Sustainability Ratio fluctuates between -27% and +94%.	Investment in renewals is 11% greater than depreciation of the network. At an activity level, wastewater is 100% more than depreciation, while water is 33% lower than depreciation and stormwater is 33% lower than depreciation. As above, investment in renewals is dependent on the information provided regarding asset condition.	Meets requirements subject to discussion on asset condition assessment.	N/A
Total water services investment required over 10 years	There is a positive asset investment ratio for all years of the Plan, ranging from 78% to 254%.	This is consistent with asset management plans and the Infrastructure Strategy. As above, investment is dependent on the information provided regarding of asset condition.	Meets requirements subject to discussion on asset condition assessment.	N/A
Average remaining useful life of network assets	Increasing asset consumption ratio, from 62.7% to 69%, asset average life remaining is increasing. The ratio is increasing which indicates that the planned renewals investment will result in an increase in the average age of assets in the network.	The ratio is increasing which indicates that the planned renewals investment will result in an increase in the average age of assets in the network.	Meets requirements	N/A
Assessment of financing sufficiency				
Confirmation that sufficient funding and financing can be secured to deliver water services	The charts and tables show WDC will provide three waters services while meeting all lending covenants during the Plan period. Key points: • No formal limit is set on three waters debt to revenue for internal borrowing; • All capital spending is funded by revenue or debt; • Three waters debt stays below 500% of revenue in 2034. Financing relies on WDC getting a credit rating by 30 June 2032. The Plan allows for this in 2027/28 or 2028/29, and early talks suggest this is achievable.	The Plan confirms sufficient funding and financing can be secured to deliver water services. We note that WDC needs to obtain a credit rating to allow it to increase its borrowing limit from 175% to 280% with LGFA. We recommend that WDC works closely with rating agencies and LGFA to achieve a rating and the Department monitor receipt of this during implementation.	Meets requirements	Yes

Sensitivity: General

Section in Part D	Summary of content in Plan	Assessment Review Comment	Assessment	Focus for panel
Projected council borrowings against borrowing limits	WDC debt remains within lending covenants over the Plan period, with no breaches forecast in 30-year modelling. The debt to revenue ratio lending covenant is assumed to be 280%. This requires WDC to secure a credit rating before any potential breach of the 175% covenant, expected in 2032/33. The Plan notes that WDC has received advice from Bancorp indicating no issues are expected in obtaining a rating.	The Plan confirms that projected council borrowings will remain within LGFA borrowing limits and assumes WDC will obtain a credit rating to allow it to increase its borrowing limit from 175% to 280% with LGFA. We recommend that WDC work closely with rating agencies and LGFA to achieve a rating and the department monitor receipt of this during implementation.	Meets requirements	Yes
Projected water services borrowings against borrowing limits	The chart shows three waters debt stays below 500% of revenue throughout the planned period. No formal borrowing limits for water services have been adopted. WDC uses a debt to revenue limit of 500% in this Plan.	The Plan shows that projected borrowings for water services stay below 500% net debt to operating revenue ratio throughout the 10 years.	Meets requirements	N/A
Projected borrowings for water services	Analysis shows that three waters debt and revenue are projected to rise significantly under the proposed model, with debt up 256% and revenue up 152% from 2025–2034. Major investment in wastewater projects in 2033–34 will increase debt, but long-term modelling indicates WDC lending covenants will not be breached. Calculations exclude development contributions and capital grants and assume no three waters-specific cash reserves.	Projected borrowings for water services increase from $56.9m to $200.8m.	Meets requirements	N/A
Borrowing headroom/(shortfall) for water services	The analysis reviews three waters debt to revenue using WDC's LGFA method: operating revenue excludes development contributions and capital grants, all debt is external, and no cash reserves are included.	The Plan shows there is borrowing headroom for water services. We note that in 2033/34 it is only $500,000, and we expect that this would be reviewed by the governance committee for three waters service delivery in due course.	Meets requirements	N/A

Sensitivity: General

Section in Part D	Summary of content in Plan	Assessment Review Comment	Assessment	Focus for panel
Free funds from operations	The Free Funds from Operations to Debt ratio has been calculated using WSCCO guidelines, but this does not apply for IBU models. WDC has correctly included 50% of development contributions and applied a 10% FFO to debt limit.	WDC water operates with positive FFO throughout the Plan, ranging from 2% to 11.1%.	Meets requirements	N/A
Assessment of financing sufficiency	Financing sufficiency based on the overall debt and revenue projections in this plan is dependent on WDC successfully securing a credit rating by 30 June 2032 at the latest. An allowance has been made within this plan for WDC to secure such a credit rating in FY 2027/28 or 2028/29, and early discussions with Bancorp have indicated that WDC should be able to secure a credit rating.	The Plan demonstrates financing sufficiency subject to WDC obtaining a credit rating to allow it to increase its borrowing limit from 175% to 280% with LGFA. We recommend that WDC works closely with rating agencies and LGFA to achieve a rating and the Department monitor receipt of this during implementation.	Meets requirements	N/A

Assessment Report: Part E – Projected financial statements for water services

Section in Part E	Summary of content in Plan	Assessment Review Comment	Focus for panel
Projected funding impact statement	The funding impact statement is provided at a combined level and at the three waters level.	Meets requirements.	N/A
Projected statement of comprehensive revenue and expense	The statement of comprehensive revenue and expense is provided at a combined level and at the three waters level.	Meets requirements.	N/A
Projected statement of cashflows	The statement of cashflows is provided at a combined level and at the three waters level.	Meets requirements.	N/A

Sensitivity: General

Projected statement of financial position	The statement of financial position is provided at a combined level and at the three waters level.	Meets requirements.	N/A

Sensitivity: General

Assessment Report: Part E – Financial projections and measures

Projected statement of comprehensive revenue and expense
Water Services Delivery Plan page 69

Projected statement of financial position
Water Services Delivery Plan page 71

Financial measures: revenue sufficiency
Water Services Delivery Plan pages 51 -56

Financial measures: investment sufficiency
Water Services Delivery Plan pages 57 - 61

Financial measures: financing sufficiency
Water Services Delivery Plan pages 62 - 67

Sensitivity: General

Assessment Report: Water Service Delivery Plan – Additional information

Additional information	Summary of content in Plan	Assessment Review Comment	Focus for Panel
Additional disclosures to support Plan	There are no additional disclosures to support the Plan.	N/A	N/A
Significant capital projects	Significant capital projects are expressed in current dollars (uninflated) and include all projects over $1 million, and any projects identified elsewhere in this Plan as being necessary to meet compliance, growth or consent renewal requirements. These tables will not reconcile perfectly with other tables in this Plan that set out capital requirements due to the exclusion of inflation and the exclusion of projects which do not meet the significance threshold.	N/A	N/A
Key issues, constraints, risks and assumptions	Key risks and assumptions are presented in a table.	We noted financial and funding risks are missing along with detailed mitigations. Additional information was provided on the anticipated risks and mitigations associated with this source of revenue.	N/A

WAITAKI DISTRICT COUNCIL

NETWORK ASSET CONDITION GRADING

November 2025

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ProjectMax
Optimising Pipeline Renewals

Table of Contents

Document Control

Revision	Date	Description	Author(s)	Reviewed by	Approved by	Issued to
Draft Rev0	21 November 2025	20251121 WDC Network Asset Condition Grading Assessment Report	Steve Apeldoorn, Nicolette Voskuilen & Eric Skowron	Steve Apeldoorn	Steve Apeldoorn	Paul Hayes
Draft Rev1	24 November 2025	20251121 WDC Network Asset Condition Grading Assessment Report	Steve Apeldoorn, Nicolette Voskuilen & Eric Skowron	Steve Apeldoorn	Steve Apeldoorn	Paul Hayes
Final Rev 2	28 November 2025	20251121 WDC Network Asset Condition Grading Assessment Report	Steve Apeldoorn, Nicolette Voskuilen & Eric Skowron	Steve Apeldoorn	Steve Apeldoorn	Paul Hayes

Project Name:	Network Asset Condition Grading Support
Report Type:	Draft
Project Number:	
Document Title:	20251121 WDC Network Asset Condition Grading Assessment Report - DRAFT Rev0
Document Version:	Final Rev2
Document Number:	1
Date:	11/28/2025
Client:	Waitaki District Council
Author(s):	Steve Apeldoorn, Nicolette Voskuilen & Eric Skowron
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File Name:	20251121 WDC Network Asset Condition Grading Assessment Report - DRAFT Rev0

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Document Control

Executive Summary

Waitaki District Council (WDC) engaged ProjectMax Limited to perform a desktop assessment of all wastewater, stormwater and drinking water network assets.

The WDC 3 waters networks, across all townships, consist of a total of 1,883km of pipelines including 1,622km of water pipes, 203km of wastewater pipes (including rising mains) and 58.6km of stormwater pipes.

For the assessment, WDC provided information for each wastewater, stormwater and drinking water network assets including unique identifiers for each asset (COMPKEY), pipe installation date, diameter and material, criticality grading and other attributes.

For assets that were previously inspected, collected condition grading information has been incorporated into the desktop assessment including approximately 70km of gravity wastewater and stormwater CCTV inspections, and approximately 6.3km of p-CAT inspections to determine wall thickness on pressure drinking water pipes.

This information was reviewed and integrated into a detailed model to establish condition grading and populate confidence grading for all assets.

Condition Grades applied in the assessment follow current Water New Zealand standards, ranging between 1 (very good) and 5 (very poor).

Confidence in asset condition is described be a grade range between A (highly reliable) and D (very uncertain). Assets where some previous inspections have occurred have been populated with Confidence Grade B. Assets with Condition Grades determined from the desktop assessment have been populated with Confidence Grade D (which is typical for asset Condition Grades determined from desktop assessment where no physical screening or inspection has occurred).

The most common pipe materials include polyethylene, PVC and asbestos cement (AC) for drinking water pipes, concrete, earthenware and PVC for gravity wastewater pipes, polyethylene, PVC and cement lined steel for wastewater rising mains and concrete, earthenware and PVC for stormwater pipes.

A model was developed to incorporate condition information from previous inspections and asset attribute information to establish Condition Grades and assign Confidence Grades. The model referenced a library of 20+ years of pipe condition data from New Zealand and other information to apply the Monte Carlo methodology for statistical distribution of Condition Grades to assets where no previous inspection data was available.

The assessment determined that of 1,883km of network pipelines, approximately 658km are of Condition Grade 4 or 5 (poor or very poor) including 42.9km of gravity wastewater, 0.5km of wastewater rising mains (including all AC and cast iron rising mains), 13.9km of stormwater and 600.8km of drinking water assets.

Approximately 9% of wastewater assets, 8% of stormwater assets and 7% of drinking water assets are Condition Grade 5 (very poor condition).

The assessment compared Condition Grades from the desktop assessment with previously determined Likelihood of Failure (LoF) data provided by WDC. The desktop assessment determined that approximately 23% of wastewater pipes, 22% of stormwater pipes and 31% of drinking water pipes are Condition Grade 4 or 5 (poor or very poor) compared to 19% of wastewater, 1.9% of stormwater and 5% of drinking water pipes from the previous LoF assessment.

The comparison of previous LoF Condition Grades and this desktop assessment generally show a reduction in the proportion of the assets in all three waters for Grades 1 and 2 (very good and good condition) and an increase in the number of assets with Grades 3 to 5 indicating a greater level of network deterioration than was previously assessed. The proportion of all 3-waters pipes in very poor condition (Grade 5) has increased from an average of 0.5% to 7.4%.

Recommendations have been made for some actions to be taken prior to April 2026 that would improve confidence in the assessed condition of pipes that are expected to impact on the quantum of assets requiring renewal within the short-term renewal planning horizon and the information needed to update the WSDP. These actions include extending the analysis of existing investigation data to better understand and justify the condition of pipes believed to be in poor condition and likely requiring renewal. Recommended actions also include undertaking a limited investigation of some pipe materials where there is a high number of pipes that are predicted to have a Condition Grade 5 (like AC pipe) that, based on low rates of reported failure, were not expected to be in such a deteriorated condition. These inspections are to determine if those pipe materials are actually performing at or worse than national averages for the asset condition. Based on these investigations and assessment the desktop assessments may require adjusts to reflect and inform renewal funding.

Longer term recommendations include development of prioritised annual inspection programmes focused on assets with a predicted Condition Grade of 4 or 5 that have not been previously inspected based on high and very high criticality scores.

Some opportunities for data improvement are recommended including collection of asset information through ‘opportunistic’ BAU to resolve pipe attribute anomalies with installation

dates and pipe material (where installation dates are inconsistent availability of pipe materials). Further recommendations have also been made to adjust base lives of some pressure pipeline material.

This desktop assessment has prepared Condition Grades and Confidence Grades for all WDC wastewater, stormwater and drinking water network assets. Outcomes are expected to be informative for responding to DIA queries on the WDC Water Services Delivery Plan.

1 Introduction

1.1 Background

Waitaki District Council (WDC) is comprised of several townships including Dunback, Duntroon, Herbert, Hampden, Kakanui, Kurow, Macraes, Maheno, Moeraki, Ngapara, Omarama, Oamaru, Otematata, Palmerston, Pukeuri, Reidston, Waitaki Bridge and Weston. WDC is responsible for provision of wastewater, stormwater and drinking water for these communities.

The Water Services Delivery Plan (the Plan) for WDC was submitted to the Department of Internal Affairs (DIA) on August 27, 2025.

The Plan was not approved because a condition assessment of wastewater, stormwater and drinking water networks presented in the Plan was considered insufficient. As a result, WDC requested a desktop condition assessment of linear water, wastewater, and stormwater network assets.

ProjectMax recommended a three-stage approach: Stage 1: Develop initial condition grading (desktop), Stage 2: Physical Inspection Prioritisation, Scoping (Stage 2a) and Technical Support (Stage 2b, if required) and Stage 3: Inspection outcomes review, analysis, reporting, and revised condition and confidence grading for inspected assets.

This report outlines the methodology, analysis, results and recommendations from Stage 1.

1.2 Department of Internal Affairs Review

On 6 October 2025, DIA provided a response to WDC informing that the Plan was not considered in compliance with the Local Government Water Services Preliminary Arrangements Act of 2024 (the Act).

Following financial, technical and legislative assessments, the DIA concluded that the WSDP did not satisfy requirements for the assessment of the current condition, lifespan and value of the drinking water, wastewater and stormwater networks under Section 12(1)(h) of the Act.

The DIA response noted that condition grading information for drinking water and stormwater networks was missing and reliance of dated information on wastewater network grading was noted.

An amended Plan was requested by the DIA, noting it should include an assessment of the current condition, lifespan and value of the drinking water, wastewater and stormwater networks.

1.3 Project Stages

1.3.1 Stage 1: Desktop Assessment

The desktop assessment scope includes data request, data review and desktop assessment of network condition.

1.3.2 Stage 2: Asset Inspection

Stage 2 scope includes prioritisation, scoping and technical support (if required) for physical asset condition inspection. Stage 2 scope is not included in this report but is recommended for completion in FY25-26 to enable commencement of a condition inspection programme in FY26-27.

1.3.3 Stage 3: Assessment of Inspected Assets & Condition Grade Update

Following completion of inspections in Stage 2, inspection data should be audited, reviewed, and analysed to establish final structural (and service) condition grades and confidence grades.

2 Methodology

2.1 Approach

2.1.1 Structural Condition Grading

Standard definitions for the condition grades are presented in Table 1. The definitions are aligned with the New Zealand Gravity Pipe Inspection Manual (4th Edition) (Section E1.2 Table E1.1), the New Zealand Pressure Pipe Inspection Manual (Section C2.3 and Section C3 through Section C9) and the International Infrastructure Management Manual (IIMM) condition grading descriptions.

Table 1 Structural Condition Grades

Structural Condition Grade	Structural Definitions		
	Gravity WW & SW Pipes	Pressure WW Pipes	Pressure DW Pipes
1 (Very Good)	As new condition. No structural defects or evidence of internal deterioration.	As new condition. Exceeds 2x minimum design factor of safety of 2. No structural defects or evidence of internal deterioration.	As new condition. No structural defects or evidence of internal deterioration. Exceeds 2x minimum design factor of safety of 2. No structural defects or evidence of internal deterioration.
2 (Good)	Some structural defects are evident, causing minor deterioration. If defects worsened it would not result in structural failure.	Some minor deterioration evident but still exceeding minimum design factors of safety (>2). If defects worsened it would not result in structural failure.	Some structural defects evident, causing minor deterioration. If defects worsened it would not result in structural failure. Still exceeding minimum design factors of safety (>2). If defects worsened it would not result in structural failure.
3 (Moderate)	Structural defects present with moderate deterioration that is beginning to affect structural performance. If the defects worsened it could lead to structural failure	Generally sound although with evidence of some external or internal deterioration. Current condition meets minimum design factors of safety (2). If the defects worsened it could lead to structural failure	Structural defects present with moderate deterioration that is beginning to affect structural performance. If the defects worsened it could lead to structural failure. Current condition meets minimum design factors of safety (2).
4 (Poor)	Significant defects present with serious deterioration evident affecting the structural integrity. If defects worsened it would lead to structural failure.	Significant level of external or internal deterioration. Current condition factor of safety is less than 2 which is below minimum design factors of safety. Pipe is at risk of failure if subject to pressure surges.	Significant level of external or internal deterioration. Current condition does not meet design factor of safety of 2. At risk of failure due to pressure surges.

Structural Condition Grade	Structural Definitions		
	Gravity WW & SW Pipes	Pressure WW Pipes	Pressure DW Pipes
		Further deterioration would lead to failure	
5 (Very Poor)	Deterioration has extended to a point where structural failure is imminent or has already occurred.	Deterioration has extended to a point where there are no reliable structural capacity and failure is imminent or has already occurred. The remaining factor of safety is <1.	Deterioration has extended to a point where there are no reliable structural capacity and failure is imminent or has already occurred.

2.1.2 Confidence Grading

Data confidence grading applies a letter grade of A through D for highly reliable asset condition information through to very uncertain asset condition data, respectively. This method for grading asset condition confidence has been referenced in New Zealand water industry standards as far back as the NZWWA Infrastructure Asset Grading Guidelines in 1999. More recently, this approach to tracking asset condition data confidence has been referenced in the New Zealand Gravity Pipe Inspection Manual (4th Edition) published in 2019 and the New Zealand Pressure Pipe Inspection Manual published in December 2024.

Confidence grading for condition grading from desktop assessments are Confidence Grade D.

A summary of confidence grading is presented in Table 2.

Table 2 Confidence Grades

Confidence Grade	General Meaning	Type of Information
A	**Highly Reliable:** Data based on sound records, procedures, investigations and analysis which is properly documented and quality assured. Recognised as the best method of assessment including verification on site.	Medium/High Resolution screening inspection plus NDT/DT testing. Known pipe attributes including duty range, pipe class/wall thickness
B	**Reliable:** Data based on sound records, procedures, investigations and analysis, which is properly documented and quality assured. Has minor shortcomings; for example, the data is old, some documentation is missing, and reliance is placed on unconfirmed reports or some extrapolation.	Medium/High resolution screening inspections only Known pipe attributes including duty range, pipe class/wall thickness

Confidence Grade	General Meaning	Type of Information
C	**Uncertain:** Data based on sound records, procedures, investigations and analysis which is incomplete or unsupported, or extrapolation from a limited sample for which grade A or B data is available.	Discrete sampling (NDT/DT) only Or Low-resolution screening. Limited known (verified) pipe attributes
D	**Very Uncertain:** Data based on incomplete information or of uncertain quality. May include unconfirmed verbal reports and/or cursory inspection and analysis and are not verified by site checks.	Visual or desktop review Historical test result (where data confidence is not known) Low Resolution analysis/probability of failure assessments.

2.2 Input Data

2.2.1 Pipe Attributes

Attribute data for assessed wastewater, stormwater and drinking water pipes was provided by WDC. Asset ID (COMPKEY), installation date, pipe material and pipe diameter and modelled pressure (Drinking Water only) were the key attribute fields referenced in this assessment.

2.2.2 Existing Condition Grading

The desktop assessment of the WDC pipe networks includes prediction of asset conditions, and where available the assessed condition grades from completed investigations. Where physical inspection data is available this would supersede predicted condition grades. WDC provided the following inspection data for inclusion with the overall assessment data:

CCTV Inspections of Wastewater and Stormwater Gravity Pipes

In total WDC has completed 70.4km CCTV inspections of wastewater and stormwater pipes over a 24-year period from 2001 to 2025. Because of the 'age' of some of the inspections, it was anticipated that not all of the inspections supplied could be used for the assessment of the current pipe condition as it could be expected that the condition of the pipe may have changed since the inspection was completed. An evaluation was undertaken to determine which inspections could, with reason, be used for the desktop assessment.

This evaluation considered what expected change in pipe condition could reasonably be expected to have occurred to the pipe condition (i.e., increase in the pipe condition grade) from the time of the inspection to the present day.

Table 3 and Table 4 shows the outcomes of this evaluation based on amount of time since the inspection (expressed as percentage of the base life that has passed). The evaluation was conducted as two separate evaluations based on two different base life scenarios applicable to the pipe materials that have been inspected. The tables show the scenarios where no change is expected to have occurred (shown as '"0" and highlighted green) as well as where the change is expected to have occurred and by how much (shown as "+1" grade change or "+2" grade changes).

The scenarios where no grade change is expected to have occurred identified the inspections that could reasonably be used for assessment of the current pipe condition.

Table 3 Inspections of Gravity Pipes with Base Life of 120 years

			Base Life of 120 years				
			% of Base Life since inspection (to 2025)				
			24	18	13	6	4
		Original	20%	15%	11%	5%	3%
% of Expected Base Life	10%	1	+1	+1	+1	0	0
	15%	1	+1	+1	+1	+1	+1
	30%	2	0	0	0	0	0
	40%	2	0	0	0	0	0
	45%	2	0	0	0	0	0
	50%	2	+1	+1	0	0	0
	55%	2	+1	+1	+1	0	0
	65%	2	+1	+1	+1	+1	+1
	70%	3	+1	0	0	0	0
	80%	3	+2	+1	+1	0	0
	85%	3	+2	+2	+1	+1	+1
	90%	4	+1	+1	+1	0	0
	98%	4	+1	+1	+1	+1	+1
	100%	5	0	0	0	0	0

Table 4 Inspections of Gravity Pipes with Base Life of 100 years

			Base Life of 100 years				
			% of Base Life since inspection (to 2025)				
			24	18	13	6	4
		Original	24%	18%	13%	6%	4%
% of Expected Base Life	10%	1	+1	+1	+1	+1	+1
	15%	1	+1	+1	+1	+1	+1
	30%	2	0	0	0	0	0
	40%	2	0	0	0	0	0
	45%	2	0	0	0	0	0
	50%	2	+1	0	0	0	0
	55%	2	+1	+1	+1	0	0
	65%	2	+1	+1	+1	0	0
	70%	3	+1	0	0	+1	+1
	80%	3	+2	+1	+1	0	0
	85%	3	+2	+2	+1	+1	+1
	90%	4	+1	+1	+1	0	0
	98%	4	+1	+1	+1	+1	+1
	100%	5	0	0	0	0	0

Both tables show similar outcomes with the only difference being where the age of the pipe at the time of the inspection 70% of the base life of the pipe.

Some exceptions to the above evaluation were made to further enhance the use of assessed condition from inspections. These included:

1. Inspections where the assessed grade was between 1 and 3 where the inspections were completed between 2021 and 2025
2. All pipe inspections where the assessed grade was a 4. These were accepted because while some grade 4 pipes may have deteriorated to a grade 5, the likelihood of failure was significant and excluding inspections with a grade of 4 would be detrimental to a fair assessment process.

As a result of the evaluation process 32.9km of inspections were accepted for use within the desktop assessment.

Confidence in the condition assessment from the CCTV inspections.

The assessed condition grades from the CCTV inspection are generated based on a process called Scoring Analysis using the Peak Score generated from the CCTV inspection reports (refer to section E1 Preliminary Condition Grading, New Zealand Gravity Pipe Inspection Manual, 4th Edition, 2019). The condition grade generated is referred to as a 'Preliminary Condition Grade' as the reliability of the condition grade is not considered as being high. This is because there can be significant variability in the quality of the CCTV reporting (leading to incorrect assessments) and also due to the limitations of the scoring analysis process itself, in particular for inspections completed under the earlier 2nd and 3rd editions of the pipe inspection manual. The variabilities often lead to condition grades that tend to overstate the pipe condition typically resulting in a greater proportion of grades 3 to 5 than would result from a more detailed engineering review of the inspection video. On this basis the confidence grade allocated to the CCTV condition assessment grades at most is a B.

p-CAT Inspections of 450mm and 600mm diameter Cast Iron Drinking Water Pipes

In August 2024 WDC completed inspections of approximately 6.3km (29 assets) of parallel Cast Iron trunk mains within the drinking water network using inverse transient pressure analysis (p-CAT). These 450mm and 600mm diameter pipes installed in 1883 start at Oamaru water treatment plant (WTP) and connect to Oamaru township reticulation network on Eden Street and Thames Street.

The assessment from this investigation found that these pipes were in good to moderate condition (Grades 2 and 3).

Confidence in the condition assessment from the p-CAT inspections

While the investigations had measured the remaining wall thickness, the assessment of the pipe condition has been based on percentage of the remaining wall in comparison to the original wall thickness and not the assessment of the remaining structural capacity of the pipe wall (refer to 2.3 Approach, Limitations and Assumptions, Cast Iron Pipes). While the assessment provides confidence above a predicted grade as it utilises a measured remaining wall thickness, as it does not consider the actual pipe capacity it cannot be considered as high confidence. On this basis the confidence grade allocated to the p-CAT condition assessment is a grade B.

2.2.3 Pipe Materials

The WDC 3 waters network consists of a total of 1,883km of pipelines including 1,622km of water pipes, 203km of wastewater pipes (including rising mains) and 58.6km of stormwater pipes.

There are 16 unique material code attributes within the WDC data set, several of these relate to plastic pipes. As part of the assessment process these material codes were simplified clustering groups of subset materials under a single material attribute as shown in Table 5. The reclassified material codes are referenced within this report when referring to the various pipe materials.

Table 5 Reclassification/Grouping of Pipe Materials for the Assessment Process

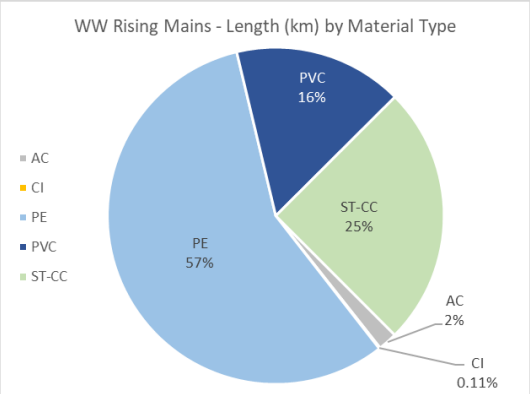
Reclassified Material Code	Reclassified Name	Material Code List from Pipe Attribute Data Supplied
ABS	Acrylonitrile Butadiene Styrene	ABS
AC	Asbestos Cement	AC
CC	Reinforced Concrete Pipe	CC
CI	Cast Iron	CI
DI	Ductile Iron	DI
PE	Polyethylene	HDPE, MDPE, PE, PE80, PE_100,
PVC	Polyvinyl Chloride	PVC, PVCm, PVCo, PVCo_S1, PVCo_S2, uPVC
ST-CC	Steel Cement Lined	ST-CC
ST	Steel	ST
Galv	Galvanised Steel	GALV
RL	Relined Pipe	FF-CIPP, UV-CIPP
EW	Earthenware	EW
SN	Stoneware	SN

The pipe materials in each of the water types mostly consist of three to four predominant material types along with a much smaller proportion of other materials as can be seen in Graphs 1 to 4 and in Table 6.

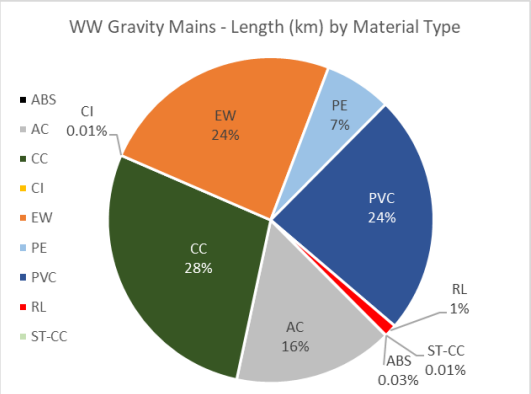
Table 6 Pipe Materials by Water Type

Water Type	Major Materials	Minor Materials (<10%)
Wastewater Rising Mains	PE, PVC, ST-CC,	AC, CI
Wastewater Gravity	CC, EW, PVC, AC,	PE, RL, ST-CC, ABS, CI
Stormwater Gravity	CC, EW, PVC	AC, ST, SN, PE, CI
Water Mains	PE, PVC, AC	CI, ST, GALV, DI

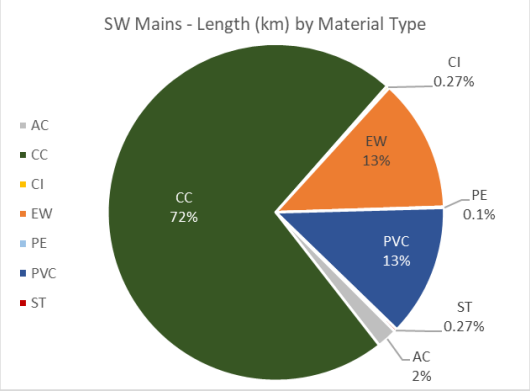
Graph 1 Wastewater Rising Mains: Length by material type



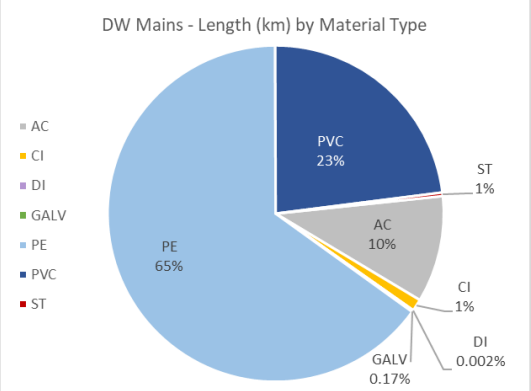
Graph 2 Wastewater Gravity Mains: Length by material type



Graph 3 Stormwater Mains: Length by material type



Graph 4 Drinking Water Mains: Length by material type



The data review process prior to the condition assessment identified some material anomalies. These anomalies are unexpected install dates associated with pipe material. These are identified as follows:

Table 7 Material Data Anomalies

Material	Install Decade	Occurrences	Comment
PE	1880	1	Likely GIS date not updated
	1910	2	
PVC	1880	1	
	1881	1	
	1946	1	
AC	1880	1	Incorrect GIS date but material should be confirmed
	1938	1	Material should be confirmed
	1994 to 2017	20	Likely GIS material not updated
CI	2013	2	

No changes were made to the data supplied and the assessments were undertaken using the existing attribute data with the anomalies. As the number of anomalies are small compared to the overall data, it is acknowledged that these anomalies are expected to result in a condition assessment of these particular pipe assets that will not reflect the actual material in place. These anomalies should be reviewed and corrected to improve confidence in the assessed condition.

WDC has applied pipe material data confidence rating descriptions against each pipe asset. These define confidence in the identification of the pipe material ranging from very Low to Very High. In addition, the confidence description includes identification as to the source of the data (e.g., "Assumption", "Asbuilt", "Survey/Inspection"). In a small number of cases, confidence in the pipe material is unknown. As the desktop condition assessment relies on the pipe material to apply the appropriate assessment model, this confidence rating system is very positive and can determine where value could be gained by improving the confidence on the pipe material attribute. Table 8 identifies the number of pipe assets where the assessed pipe condition is poor or very poor, (grades 4 and 5) and the material confidence rating is Low or Very Low. If these materials were to change it is likely that this would result in a change in the assessed condition. However, in perspective, the number of assets identified in Table 8 represents less than 2% of all the assets. To help close these gaps over time and further enhance the material reliability it is recommended that WDC collect information and update or confirm the pipe materials (along with other attribute data, e.g., pipe diameter) through opportunistic data collection as part of BAU, (e.g., as part of reactive maintenance or planned inspections) in particular for the assets that are believed to be in poor or very poor condition and have low or very low confidence in the pipe material.

Table 8 Overview of assets with assessed condition grades of 4 and 5 with low material confidence

Row Labels	Material Confidence	Condition Grade 4	Condition Grade 5	Sum	Condition Grade 4	Condition Grade 5	Sum
WW Gravity	Combined	**26**	**16**	**42**	**1,668**	**3,178**	**4,846**
	Low, Archive Info	1		1	29		29
	Low, Assumption	1		1	1		1
	Unknown	24	16	40	1,638	3,178	4,816
WW Rising	Unknown	**10**	**4**	**14**	**2,917**	**2,214**	**5,131**
SW	Combined	**69**	**13**	**82**	**3,631**	**547**	**4,178**
	Low, Assumption	63	11	74	3,534	326	3,860
	Low, Survey / Inspection		1	1		119	119
	Very Low, Assumption	2		2	8		8
	Unknown	4	1	5	89	102	191
DW	Combined	**196**	**49**	**245**	**17,543**	**5,453**	**22,996**

Methodology

Row Labels	Material Confidence	Condition Grade 4	Condition Grade 5	Sum	Condition Grade 4	Condition Grade 5	Sum
	Low, As Builts	20	3	23	5,869	1,566	7,435
	Low, Assumption	10	1	11	2,172	1,408	3,581
	Low, Local / Contractors Knowledge	20	2	22	1,986	903	2,889
	Very Low, Assumption	8	3	11	401	52	453
	Unknown	138	40	178	7,115	1,523	8,638
Sum		**301**	**82**	**383**	**25,759**	**11,391**	**37,150**

2.3 Approach, Limitations and Assumptions to Condition Assessment

The approach to undertaking the desktop assessment of the water assets is a multi-model approach differentiated largely by gravity pipe assets and pressure pipe assets as follows:

Gravity Pipes – Assessment is based on utilising a database of assessments and apply statistical analysis for various pipe material and diameter cohorts and apply to the WDC gravity assets using Monte Carlo Simulation. The intent is to determine the likely condition of each gravity pipe based on the likely condition of pipes of the same material, age and where possible diameter.

Pressure Pipes – individual condition assessment models have been developed for the dominant pressure pipe materials (CI, AC, PE and PVC).

Minor and small quantity pipe materials – for the pipe materials where there is little or no gravity pipe assessments or where the development of assessment models is not economical, pipes have been assessed based on historical evidence of performance, or industry technical guidelines.

The following discusses the basis of the application of the pressure pipe assessment models as well as setting out the assumptions made and discussing the factors and limitations that will affect the desktop assessment of pipe condition.

Plastic Pressure Pipes

Although studies have identified a number of potential failure modes and factors (such degradation due to chemical attacks, crack growth, pressure fatigue, and the influence of environmental factors), in practice there is little concrete evidence linking these with failure rates or residual life.

The primary failure mechanism for PVC & PE pipes is poor installation or manufacturing defects and in instances where the pipeline is subjected to high internal pressures, or higher

cyclic loadings, cracking (or micro-cracking) can occur. For example, resistance to slow crack growth in PVC has been found to decrease with time (at least in accelerated ageing tests) for pipes produced in the 1970s, but not for more recent (post 1997) pipe specifications.

The adoption of joint standards and specific variations and types of material have developed significantly since the late 1970s leading to increased expected lives. Research shows the fact that the lifetime of the average well installed PVC pressure pipe has almost certainly been extended through steady improvements to material quality as invoked by the 1987 (*NZS 7648:1987)* and 1997 (*AS/NZS 1477:1997)* standards. For example:

- A PVC pipeline constructed in e.g. 1979 may be expected to have had an economic life of 50 years when new and therefore should be considered to be in Grade 4 (or worse) condition now and have a residual life of 0-10 years.
- A pipeline installed in e.g. 1990 manufactured to the 1987 standard may reasonably be expected to have a longer economic life of, say, 70-80 years and therefore currently have a residual life of 35-45 years and can be assumed to be in a "mid-life" Grade 3 condition by default.
- A pipeline installed in 2000 manufactured to the 1997 standard may be expected to last 100 years with a current residual life of 75 years (and is likely to be in Grade 1 or Grade 2 condition at worst*).

**There are studies which show that exhumed in-service PVC pipe shows little or no degradation following destructive testing after 20-30 years. These are likely to be pipes manufactured to a standard at least consistent with the 1987 if not the 1997 AZ/NS standard, which have been handled and installed appropriately.*

The examples above are supported by the failure rate observations within the Noell paper on the Seismic Performance of Plastic Pipe Systems in 2010/11 Canterbury Earthquakes, which compares the historical performance of PVC and PE pipelines through various vintages, and helpfully broadly aligns their analysis to the same periods in which the standards changed.

From this paper, there is clear evidence of the significant change in performance in the water mains installed between 1986-1996 (0.76 repairs/km) and between 1997 and 2006 (0.41 repairs/km). PVC pipes installed before 1986 failed more frequently still (1.14 repairs/km).

The Noell paper was one of the main sources for Table C.8 (Table 9 below) within the New Zealand Pressure Pipe Inspection Manual (1st Edition, 2024) for Estimating the Remaining Life of PVC pipe.

Methodology

Table 9 Pipe material considerations

Material	Installation Date	Consideration
PVC-U	Before 1986	Fracture toughness requirement had not yet been incorporated into BS 3505, and pipes may have relatively low resistance to slow crack growth. As pipes will already be over 38 years old, crack growth should be assumed to be occurring, and condition grades should not be better than grade 4. Pipes with a history of bursts that cannot be attributed to specific causes may be approaching (or have approached) the end of their useful operational lifetimes.
All PVC	Before 1997	PVC manufacturing standard AS/NZS 1477 was introduced in 1997. Some variances in additives and performance of pipes may be present between manufacturers leading up to this date. Condition grade should not be better than grade 3.
PVC-O	After 2008	PVC-O against AS/NZA 4441 has better fracture toughness than PVC-U and better fatigue resistance than PVC-U and PVC-M
PVC-M	After 2000	PVC-M against AS/NZS4765 has improved fracture toughness relative to PVC-U but inferior fatigue resistance.

The selection of 1986 and 1997 as milestone dates in table C.8 was deliberately aligned to the introduction of the new standards NZS 7648:1987 and AS/NZS 1477:1997 which progressively tightened the specification of PVC pipelines for pressure applications in various ways and aligns with the Noell paper observations of failures.

PE pipes have also seen improvements to the material specifications and availability over time. Early PE prior to 1970 is likely to be either Low-Density PE or Type 50 HDPE. Most of the PE pipe installed in WDC was from 1967 onwards. Mono Polymer and Bi- or Multi-Modal Polymer materials began to be available from the early 1980's and from 2000 PE100 and PE100RC materials were further introduced. While manufacturers would state that an expected life of 100 years should be expected for all PE materials evidence would suggest that prior to 1985, the expected service life would better be considered as 80 years.

Several lifetime prediction models (e.g. using the standard extrapolation method based on hydrostatic tests, linear elastic fracture mechanics and using quality number) have been utilised in the literature in order to describe some of these failure mechanisms and estimate the residual lifetime of plastic pipes. However, given their limitations, the predicted lifetimes are certainly open to dispute, as no model encompassing all possible failure mechanisms has been proposed yet.

In the absence of a defined model for predicting remaining life of plastic pipes, the method used for this condition assessment is based on the evaluation of the residual (remaining) life

of the pipe from its date of installation against the expected service life of the pipe based upon the time period set out in the discussion above relating to and expressed Table 10.

Table 10 Expected Service Life of Plastic Pipes

Material	Installation Period	Expected Service Life	WDC Base Life
PVC	Install prior to 1986	50[1] years	100 years (modified base life varying from 80 to 100 years)
	Install between 1986 to 1997	80[1] years	
	Install after 1997	100 years	
PE	Install prior to 1960	70 years	80 years (modified base life varying from 64 to 96 years)
	Install 1960 to 1985	80 years	
	Install after 1985	100 years	

[1] *For the PVC where the modelled pressure for the pipe is less than or equal to 60mh2o a service life of 100 years has been used.*

As the improvements to PVC specifications have predominantly had the effect of improving the expected length of life by reducing the failure through fatigue, a higher expected service life of 100 years has been adopted for the assessment of PVC pipes in the drinking water network that have lower pressure. This has been adopted to recognise that lower pressures within the network are less likely to lead to early failures and therefore the pipes manufactured to 'lower' specifications are also less likely to fail by this method. This approach for pipes with low pressure was intended as part of the assessment process to avoid unfair assessment of the older PVC pipes in the network where the likelihood of fatigue failures is less. This default higher service life has not been applied to the Wastewater Rising Mains as these are more likely to be subject to higher frequency pump cycles.

The assessed condition grade is assigned based on the calculated remaining life as shown in the following

Table 11 which is taken “Table C.18 Remaining Life Based on Condition Grade” from Section C of the New Zealand Pressure Pipe Inspection Manual (1st edition 2024)

Table 11 Condition Grade based on Remaining Life

Condition Grade	Remaining Life
1 Very Good	>50 years
2 Good	30-50 years
3 Moderate	10-30 years
4 Poor	3-10 years
5 Very Poor	<3 years

Limitations

Several factors can influence the deterioration of the plastic pressure pipes, and the actual lives of these pipes may extend well beyond the stated expected service lives used for the assessment. Factors such as the pressure, presence of transient pressures and cyclic frequencies within the networks all potentially work to either increase or decrease the expected lives. The use of the variable expected lives based on the development of material specifications over time and published research demonstrating decreased rates of failure is, in the absence of more robust prediction models, a reasonable basis for a desk top assessment of the plastic pressure pipes.

The confidence grading applied to the assessed condition of the plastic pressure pipes of Grade D (very uncertain) reflects that possible variability of the performance of the plastic pipes over the network and other influencing (non-deterioration related) factors such as installation or material defects may have that cannot be effectively evaluated from a desk top assessment. There are also no field investigation results from WDC that can be used as a comparative benchmark.

Cast Iron Pipe

Cast iron is here refers to both vertically cast and spun iron. While the method of manufacture affects the wall thickness and the consistency of the wall thickness, the deterioration mechanisms and approaches to condition assessment are identical.

For cast iron pipes, the primary deterioration mechanism is internal and external corrosion, which causes an overall reduction in wall thickness accompanied by localised pitting. Typically, the ultimate cause of failure for the majority of cast iron pipes is not simply via through-wall corrosion, but by a mechanism whereby corrosion weakens the pipe to the extent that it can no longer withstand the stresses associated with internal operating pressure and external loading factors.

Methodology

Remaining wall thickness is the predominant indicator by which condition grade and remaining time to failure are estimated. The rate at which a cast iron pipe corrodes is dependent on both environmental factors and the precise interaction mechanism between the environment and the iron in the pipe.

For the desk top condition assessment environmental factors such as soil properties etc. are not available and therefore the rate of pipe wall loss through corrosion is assumed as constant corrosion rate. The assumed rate of corrosion applied for these assessments has been derived from the maximum rate of observed corrosion from the p-CAT inspections undertaken on the WDC 450mm diameter CI water mains in August 2024. This maximum rate of deterioration of CI mains was 0.061mm/year. The choice of the maximum rate of corrosion was chosen to reflect the 'worst-case' scenario.

As WDC information does not provide a record of the original pipe wall thickness, Look-up tables were developed based on the pipe diameter and modelled pressure within the drinking water network*. The dimension of the original wall thickness was derived from the most applicable manufacturing standard for the vintage of the majority of the cast iron pipes (BS78: 1917) which (using the diameter and current pressure) defines the most likely pipe class and therefore wall thickness.

**Modelled pressure for the Wastewater Rising Mains was not available, however the reported pressures at the pumpstations did not exceed 61m and so therefore a default of Class B was used to determine the original pipe wall thickness of the Wastewater CI Rising Mains.*

The condition grades are then inferred from the calculated remaining wall thickness based on Table 12 below. This table is Table C.6 CI condition Grades and is based on the assessment methodology used by the New York City Department of Environmental Protection for evaluation of CI pressurised mains.

Table 12 Condition Grade based on % of wall loss (CI Pipe)

Condition Grade	Remaining Life
1 Very Good	0-25% wall thickness loss
2 Good	Wall thickness loss between 25-50%
3 Moderate	Wall thickness loss between 50-75%
4 Poor	Greater than 75% loss of wall thickness at any cross section. Noticeable sag or change in cross-section
5 Very Poor	Cracks, breaks, significant change in cross section, bending deflection >4mm

Note for this Assessment Table C.6 was modified to evaluate Grade 5 (very Poor) where the amount of wall loss exceeded 85% of the original pipe wall. The exception to the above grading method is where the modelled pressure is less than or equal to 30mh2o, a default grade of 2 is applied.

Limitations

Whilst the benefit of estimating the remaining life using this method is a more realistic estimation of the pipe condition than using residual age (from an assumed base life) there are several assumptions that are applied. These are primarily:

- Selection of the original wall thickness based on pipe class using the current modelled pressure. This assumes that the current pressure is similar to the pressure applied for the design of the pipe. A lower modelled pressure compared to the design could underestimate the original wall thickness therefore resulting in a poorer assessed condition than maybe justified. Equally the opposite could be true if the modelled pressure is more than the original design assumptions.
- The applied rate of deterioration is based on the 2024 p-CAT inspections. The maximum rate of deterioration from the 2024 investigations is similar to the average rate of deterioration assessed from other p-CAT inspections of CI pipes in Wellington and Auckland. This indicates that the rate of deterioration in WDC is slower than in other observed locations. Given the type of soil present in the region, which is not known to generally be highly corrosive, this could be a reasonable assumption. However, if the actual rates of deterioration are higher in other CI pipes in WDC then the rate applied could understate the pipe condition.
- Use of percentage of wall loss to assess the pipe condition. This method has been utilised by other water utilities for estimating the pipe condition, as per the example used within the New Zealand Pressure Pipe Inspection manual. However, the actual remaining life of the pipe, and therefore the condition of the pipe as noted above, is based on the pipe capacity to withstand the loads applied upon it. The actual condition will be dependent on the measured loading, including surge/transients and the actual least amount of pipe wall remaining to resist it.

Comparing the assessed grades for all of the CI drinking water pipes against the grades generated from the p-CAT inspections shows comparative results which tend to indicate that the predicted grades using the desk top assessment method are reasonable within expected ranges.

Methodology

Table 13 Comparison of Assessed Grade v Predicted & Assessed Grades (CI pipes)

Condition Grade	Assessed from p-CAT	Predicted and assessed
1	0%	5%
2	35%	61%
3	65%	28%
4	0%	6%
5	0%	0%

The method used by WSP for assigning condition grade for the p-CAT assessments is very similar but based on the percentage remaining wall, which simply can be converted to the equivalent of percentage of wall loss. However, when converted the values used within the grading ranges differs from that set out within the New Zealand Pressure Pipe Inspection Manual. The range used for the assessment of the p-CAT inspections are as follows:

Table 14 Condition Grade Based on Remaining Wall Thickness (WSP, CI Pipe)

Grade	Remaining Wall Thickness	Conversion to Wall Loss
1	90 – 100%	<10%
2	80 -90%	10 – 20%
3	70 – 80%	20 – 30%
4	60 -70%	30 – 40%
5	<60	>40%

The Methodology used for this assessment has applied the grade ranges for wall loss utilising the Table 12 consistent with the New Zealand Pressure Pipe Inspection Manual.

As part of the review and comparison of the WDC data it was observed that pipe assessed from the p-CAT investigation's completed and also from this desktop assessment determined that while the CI pipes had in many cases reached the WDC base life age the assessed condition was good or moderate condition indicating that the expected life of the CI pipes will well exceed the current base life. On this basis WDC could review and increase the current base life of 150 years to a possible minimum of 200 years based on the assessed condition.

Asbestos Cement Pipe

Failures in asbestos cement (AC) pipes are most identified through reduced structural wall thickness/competency which then eventually causes a burst of the pipe wall. Asbestos cement is susceptible to lime leaching and sulphate attack which results in softening of the interior and/or exterior surfaces of the pipe which reduces the structural wall thickness of

the pipe. This would often occur without a reduction in the physical thickness of the pipe wall.

Remaining structural wall thickness is widely adopted as the best indicator of remaining life of AC pipe for pipes without other known defects. Structural thickness, as with the CI pipe is the ability of the pipe to bear a structural load, in terms of equivalent thickness of a new pipe. In the case of AC pipe, this is commonly calculated as the original pipe thickness minus the deterioration thickness. This of course needs to be physically measured.

As a desktop assessment, in the absence of measurement of the remaining pipe wall thickness from a physical inspection, an estimate of the expected life of the AC pipe can be obtained by using national average deterioration rates provided by the Lifetime Prediction Charts within the Asbestos Cement Manual (Water New Zealand, Volume 2, 2017) for a particular class of pipe.

As WDC information does not provide a record of the pipe class, A look-up table has been developed based on the pipe diameter and a default pipe class. The default pipe class is for various pipe diameters is set out in within the Asbestos Cement Manual (Water New Zealand, Volume 1, 2017).

The 'fits' of these linear models are not precise, but the method provides an opportunity to estimate the expected life of the AC pipe based on observed national rates of AC pipe deterioration. The remaining life of the AC pipe can then be estimated by deduction of the pipe age from the maximum expected life for a particular pipe class and modelled pressure.

The condition grade is then inferred from the calculated remaining life as shown in the following Table 15 which, as per the method for the assessment of the plastic pipes, is taken from "table C.18 Remaining Life Based on Condition Grade" from Section C of the New Zealand Pressure Pipe Inspection Manual (1st edition 2024)

Table 15 Condition Grade based on Remaining Life (AC pipe)

Condition Grade	Remaining Life
1 Very Good	>50 years
2 Good	30-50 years
3 Moderate	10-30 years
4 Poor	3-10 years
5 Very Poor	<3 years

Limitations

Like the deterioration method for CI pipe, the benefit of estimating the remaining life utilising the Lifetime Prediction Chart within the AC manual is that it provides a more realistic estimation of the expected life based on observed national average rates of deterioration than just using residual age (from the current age and assumed base life). There are several assumptions that are applied. These are primarily:

- Selection of the pipe class based on the default class. This assumes that the pipe installed is the same as the expected default class for that pipe diameter and design pressure. If the installed pipe was a higher class of pipe, then the assumption for this assessment could underestimate the expected lifetime of the pipe therefore resulting in a poorer assessed condition than maybe justified. Equally the opposite could be true if the installed pipe class was less than the default assumption.
- Expected life expressed within the AC manual is based on the National average rate of deterioration. Deterioration of the pipe wall occurs both internally and externally. This is dependent on the chemistry of the water being transported and the corrosivity of the soil around the pipe. No information is known about the water chemistry, but there is possible indication from the p-CAT investigation of the CI pipes that the type of soil within the WDC may be less corrosive than the national average. If this is the case, then it is possible that the expected life of the AC pipe in WDC could be longer than what is included within the ranges specified within the AC manual. However, the corrosivity of the soil for individual AC pipes within WDC is not known, neither the chemistry of the flow and therefore the remaining life of the AC pipes can only reliably be confirmed by physical inspection.

At present WDC base life for AC pipe materials varies dependent on the pipe diameter ranging from 70 years to 140 years. The published data on expected lives within the AC Manual also reflects increasing expected life with increased diameter but also is dependent on whether the pipe is a drinking water pipe or a wastewater pipe. For drinking water, the highest likely pipe life ranges from 45 years to 140 years (these are based on the default class). Whereas the wastewater pipes are expected to have a much shorter life with the highest likely life ranging from 26 years to 83 years. A cursory review would indicate that the WDC base lives for drinking water appear reasonable, and could be expected, particularly in the larger diameters. However, in comparison with the AC manual, the base life would appear to be overly optimistic. A review of the assessed data does not provide any evidence that the WDC lives of the drinking water pipes should be changed. But consideration of reducing the AC wastewater pipes to reflect the AC manual lives should be given. However, noting that there are only 3 AC watermains and these have all been assessed as grade 5.

2.4 Statistical Models for Gravity Assets (Predictor)

PML used their large dataset of historic condition assessment data to determine the probability of an asset being assessed with a Condition Grade of 1 (very good) through 5 (very poor). This analysis notes that three factors are hierarchically important: material type, current age, and diameter. In addition, the analysis also indicated that diameter is a relevant factor for reinforced concrete (RC) SW assets.

Table 16 lists the seven 'Predictor' models developed by PML. Where a model may be applied to both SW and WW assets, the dataset analysed included both SW and WW data. Models applied to one water type are derived from data from only that water type, e.g., SW AC data was not used in the development of the Gravity AC WW model.

The models are separated first by water type (excepting those where the model applies to both SW and WW assets), then material category, and then the relevant factors are noted. All models used Age at Inspection as the primary factor, with either 20-year brackets used, or brackets defined by PML. The Gravity RC SW model also uses diameter brackets as sub-factors of each 20-year age bracket.

Table 16 List of Predictor Models

Name	Water Type(s)	Material Type(s)	Conditions
Gravity AC SW	SW	Asbestos Cement (AC)	Use 20 year age brackets
Gravity AC WW	WW	Asbestos Cement (AC)	Use 20 year age brackets
Gravity EW	SW and WW	Earthenware (EW)	Use 20 year age brackets until 100 years, then use a combined >100 bracket
Gravity PE	SW and WW	Polyethylene (PE)	Use two age brackets: ≤20 years and >20 years
Gravity PVC	SW and WW	Polyvinyl Chloride (PVC)	Use three age brackets: ≤20 years, 20-60 years, >60 years
Gravity RC SW	SW	Reinforced Concrete (RC)	Use 20 year age brackets Use relevant diameter brackets for each age bracket
Gravity RC WW	WW	Reinforced Concrete (RC)	Use 20 year age brackets until 80 years, then use a combined >80 bracket

The assessment undertaken does not utilise the WDC base life to determine the pipe condition. A review of the results from the assessment does not provide enough information that would indicate that the current WDC base lives are not reflective of the expected life.

2.4.1 Development

2.4.2 Probability Distribution and Application

The Predictor models define the condition grade probabilities based on material type and age factors. The application of these probabilities was applied to the WDC assets in order to calculate a predicted condition grade based on known asset data. The calculation method utilises a random number generator to apply Monte Carlo methodology.

For example, a six-sided dice has an equal probability of landing on numbers 1 through to 6. The probability expressed as a decimal is $0.16\dot{6}$. The sum of the probabilities adds to 1.

A random value of 0.38 is generated. The resulting dice face is the first result where the cumulative sum of the probabilities is less than or equal to 0.38:

Dice Face	1	2	3	4	5	6
Probability	$0.16\dot{6}$	$0.16\dot{6}$	$0.16\dot{6}$	$0.16\dot{6}$	$0.16\dot{6}$	$0.16\dot{6}$
Cumulative Probability	$0.16\dot{6}$	$0.33\dot{3}$	0.5	$0.66\dot{6}$	$0.83\dot{3}$	1
Is 0.38 ≤ the cumulative probability?	No	No	Yes	Yes	Yes	Yes

The first cumulative probability ≤ 0.38 corresponds to a dice face value of 3.

2.4.3 Application

Asset data provided by WDC included a unique asset identifier (COMP Key), water type, a material code (which was matched up to the material categories listed in this document), install year, and diameter. For WW assets, the type (rising or gravity) was also included.

Using the Install Year, the Current Age can be calculated:

Current Age = [Current Year] – Install Year

The Current Age is then used to identify which Age Group applies to the asset.

A random number is generated and then saved as a fixed value.

For all models except Gravity RC SW, the Age Group and the random number are then used in the Monte Carlo method to generate a predicted condition grade for each asset.

For Gravity RC SW, the Age Group is calculated, and then the asset diameter is used to determine the Diameter Group. A random number is generated and saved as a fixed value. Then the Age Group, Diameter Group and random number are all incorporated in the Monte Carlo method to generate a predicted condition grade for each asset.

2.5 Decision Trees for Pressure Assets

Table 17 lists the Decision Tree methodologies applied for pressure pipes. The methodology for each is detailed in sections 2.5.1.1 to 2.5.1.5.

Table 17 List of Pressure Decision Trees

Name	Water Type(s)	Material Type(s)
Pressure AC DW	DW	Asbestos Cement (AC)
Pressure AC WW	WW	Asbestos Cement (AC)
Pressure CI	DW and WW	Cast Iron (CI)
Pressure PE	DW and WW	Polyethylene (PE)
Pressure PVC	DW and WW	Polyvinyl Chloride (PVC)

2.5.1.1 Pressure AC DW

WDC data required: COMP Key, Install Year, High Pressure, Diameter

- Use High Pressure to determine Pressure Group

High Pressure (m)		
Lower Range (>)	**Upper Range (<=)**	**Group**
0	30	30
30	60	60
60	90	90
90	1000	120

- If High Pressure is not specified, use Diameter to identify Default Pressure
- For all assets, use Diameter to identify Diameter Group

Diameter (mm)			Default Pressure (m)
Lower Range (>=)	**Upper Range (<=)**	**Group**	
0	50	50mm	120
51	75	75mm	120
76	80	80mm	120
81	100	100mm	120
101	150	150mm	90
151	200	200mm	90
201	225	225mm	90
226	250	250mm	90
251	300	300mm	90
301	375	375mm	90
376	6000	450mm	60

Methodology

- Use Diameter Group and Pressure Group to return Likely High Age (years) and Max Life (years)

Pressure Group		120			90			60			30		
Diameter Group	Default Pressure	Likely Min Age	Likely High Age	Max Life	Likely Min Age	Likely High Age	Max Life	Likely Min Age	Likely High Age	Max Life	Likely Min Age	Likely High Age	Max Life
50mm	120	24	36	47	28	39	47	32	42	47	35	45	47
75mm	120	24	36	47	28	39	47	32	42	47	35	45	47
80mm	120	24	36	47	28	39	47	32	42	47	35	45	47
100mm	120	30	45	58	34	48	58	39	52	58	44	56	58
150mm	90	41	60	80	38	56	70	46	62	70	52	67	70
200mm	90	53	77	103	44	63	82	53	70	82	62	77	82
225mm	90	56	83	112	48	70	90	57	77	90	67	85	90
250mm	90	63	91	122	49	72	95	62	81	95	72	90	95
300mm	90	76	108	147	58	86	113	72	96	113	86	106	113
375mm	90				72	104	140	90	118	140	107	131	140
450mm	60				88	122	163	54	81	105	74	96	105

- Use Install Year to calculate Current Age
    - If Current Age is less than the Likely High Age, calculate Likely Remaining Life (LRL):
        - LRL = [Likely High Age] – [Current Age]
    - If Current Age is greater than or equal to the Likely High Age:
        - If Current Age is less than Max Life, calculate Max Remaining Life (MRL):
            - MRL = [Max Life] – [Current Age]
        - If Current Age is greater than or equal to Max Life:
            - Remaining life is considered to be 0 and condition grade is 5
- Use LRL or MRL (depending on which was applied to the asset) to determine the condition grade from the table

LRL (years)			MRL (years)			Condition Grade
Lower Range (>=)	Upper Range (<)	Group	Lower Range (>=)	Upper Range (<)	Group	
0	3	<3 years	0	3	<3 years	5
3	10	3-10 years	3	10	3-10 years	4
10	30	10-30 years	10	30	10-30 years	3
30	50	30-50 years	30	50	30-50 years	2
50	300	>50 years	50	300	>50 years	1

Methodology

2.5.1.2 Pressure AC WW

WDC data required: COMP Key, Install Year, High Pressure, Diameter

- Use High Pressure to determine Pressure Group

High Pressure (m)		
Lower Range (>)	**Upper Range (<=)**	**Group**
0	30	30
30	60	60
60	90	90
90	1000	120

- If High Pressure is not specified, use Diameter to identify Default Pressure
- For all assets, use Diameter to identify Diameter Group

Diameter (mm)			Default Pressure (m)
Lower Range (>=)	**Upper Range (<=)**	**Group**	
0	50	50mm	120
51	75	75mm	120
76	80	80mm	120
81	100	100mm	120
101	150	150mm	90
151	200	200mm	90
201	225	225mm	90
226	250	250mm	90
251	300	300mm	90
301	375	375mm	90
376	6000	450mm	60

- Use Diameter Group and Pressure Group to return Likely High Age (years) and Max Life (years)

Pressure Group		120			90			60			30		
Diameter Group	**Default Pressure**	**Likely Min Age**	**Likely High Age**	**Max Life**	**Likely Min Age**	**Likely High Age**	**Max Life**	**Likely Min Age**	**Likely High Age**	**Max Life**	**Likely Min Age**	**Likely High Age**	**Max Life**
50mm	120	16	24	32	18	26	32	22	28	32	24	30	32
75mm	120	16	24	32	18	26	32	22	28	32	24	30	32
80mm	120	16	24	32	18	26	32	22	28	32	24	30	32
100mm	120	20	30	39	23	33	39	26	35	39	30	38	39
150mm	90	28	41	54	26	38	48	32	42	48	36	45	48
200mm	90	36	52	70	30	43	55	36	47	55	42	52	55
225mm	90	38	56	76	32	47	61	39	52	61	46	58	61
250mm	90	43	62	83	33	49	65	41	55	65	49	61	65

Methodology

Pressure Group		120			90			60			30		
Diameter Group	Default Pressure	Likely Min Age	Likely High Age	Max Life	Likely Min Age	Likely High Age	Max Life	Likely Min Age	Likely High Age	Max Life	Likely Min Age	Likely High Age	Max Life
300mm	90	52	74	99	40	58	76	49	65	76	58	72	76
375mm	90				50	71	94	61	80	94	73	89	94
450mm	60				60	83	110	37	55	71	50	65	71

- Use Install Year to calculate Current Age
  - If Current Age is less than the Likely High Age, calculate Likely Remaining Life (LRL):
    - LRL = [Likely High Age] – [Current Age]
  - If Current Age is greater than or equal to the Likely High Age:
    - If Current Age is less than Max Life, calculate Max Remaining Life (MRL):
      - MRL = [Max Life] – [Current Age]
    - If Current Age is greater than or equal to Max Life:
      - Remaining life is considered to be 0 and condition grade is 5
- Use LRL or MRL (depending on which was applied to the asset) to determine the condition grade from the table

LRL (years)			MRL (years)			Condition Grade
Lower Range (>=)	Upper Range (<)	Group	Lower Range (>=)	Upper Range (<)	Group	
0	3	<3 years	0	3	<3 years	5
3	10	3-10 years	3	10	3-10 years	4
10	30	10-30 years	10	30	10-30 years	3
30	50	30-50 years	30	50	30-50 years	2
50	300	>50 years	50	300	>50 years	1

2.5.1.3 Pressure CI

WDC data required: COMP Key, Water Type, Install Year, High Pressure, Diameter

- Use High Pressure to determine Class
  - If there is no High-Pressure data for DW pipes, assign Class C
  - If there is no High-Pressure data for WW pipes, assign Class B (as WDC's maximum WW pumping pressure is 60m)

High Pressure (m)			Class
Lower Range (>)	Upper Range (<=)	Group	
0	30	30	A
30	60	60	B
60	90	90	C

Methodology

High Pressure (m)			Class
Lower Range (>)	Upper Range (<=)	Group	
90	1000	120	D

- Class A = condition grade 2
- Classes B, C, D: Use diameter to calculate Design Thickness (dt) in mm

Pressure Group			60	90	120
Class			B	C	D
Lower Range (>=)	Upper Range (<=)	Group	Design Thickness (mm)		
0	75	≤75mm	9.65	9.65	10.16
76	80	76-80mm	9.65	9.65	10.16
81	100	81-100mm	9.91	10.16	11.68
101	125	101-125mm	10.41	11.43	13.21
126	126	126-126mm	10.41	11.43	13.21
127	150	127-150mm	10.92	12.45	14.48
151	175	151-175mm	11.43	13.46	15.49
176	200	176-200mm	11.94	14.48	16.51
201	225	201-225mm	12.45	15.24	17.53
226	250	226-250mm	13.21	16	18.54
251	300	251-300mm	14.48	17.53	20.32
301	375	301-375mm	16	19.56	22.61
376	450	376-450mm	17.53	21.59	24.89
451	6000	>450mm	20.32	24.89	28.7

- Use Install Year to calculate Current Age
- Calculate Remaining Wall Thickness (RWT) using 0.061 as the default rate of deterioration for WDC
    - RWT = dt – [Current Age] *x* 0.061
- Calculate Wall Thickness Loss percentage (WTL%):
    - WTL% = RWT / dt
- Use WTL% to determine condition grade from the table

WTL%			Condition Grade
Lower Range (>)	Upper Range (<=)	Group	
0.00	0.25	≤25%	1
0.25	0.50	>25-50%	2
0.50	0.75	>50-75%	3
0.75	0.85	>75-95%	4
0.85	2.00	>95%	5

2.5.1.4 Pressure PE

WDC data required: COMP Key and Install Year

- Use Install Year to calculate Base Life in years from the table

Lower Range (>=)	Upper Range (<)	Base Life (years)
1800	1967	70
1967	1985	80
1985	2100	100

- Use Install Year to calculate Current Age:
  - Current Age = [Current Year] – Install Year
- Calculate the percentage of Remaining Life (%RL):
  - %RL = ([Base Life] – [Current Age]) / Base Life
- Use %RL to determine condition grade from the table

% RL			Condition Grade
Lower Range (>=)	Upper Range (<)	Group	
0.00	0.02	<2%	5
0.02	0.16	2-15%	4
0.16	0.36	16-35%	3
0.36	0.86	36-85%	2
0.86	1.10	>85%	1

2.5.1.5 Pressure PVC

WDC data required: COMP Key, Water Type, Install Year, High Pressure, Diameter

- For DW assets with no High-Pressure data, use diameter to calculate Default Pressure

Diameter (mm)			Default Pressure (m)
Lower Range (>=)	Upper Range (<=)	Group	
0	60	60mm	60
61	6000	90mm	90

- For DW assets where High Pressure or calculated Default Pressure >60m;
  AND

- All WW assets:
  - Use Install Year to determine Base Life in years

Lower Range (>=)	Upper Range (<)	Base Life (years)
1800	1987	50
1987	1997	80
1997	2100	100

- For DW assets where High Pressure <= 60m:
  - Use Base Life of 100 years
- Use Install Year to calculate Current Age:
  - Current Age = [Current Year] – Install Year
- Calculate the percentage of Remaining Life (%RL):
  - %RL = ([Base Life] – [Current Age]) / Base Life
- Use %RL to determine condition grade from the table

% RL			Condition Grade
Lower Range (>=)	Upper Range (<)	Group	
0.00	0.02	<2%	5
0.02	0.16	2-15%	4
0.16	0.36	16-35%	3
0.36	0.86	36-85%	2
0.86	1.10	>85%	1

2.6 Static Condition Grades

Asset types that did not correlate with a Predictor model or a Decision Tree are listed in Table 18 below, along with the condition grade methodology applied.

Table 18 Other Condition Assessments

Water Type(s)	Material Type(s)	Condition Grade Method
WW Gravity	Relined (RL)	Assessed as Condition Grade 1
SW	Steel (ST)	Assessed as Condition Grade 2
DW	Ductile Iron (DI)	Assessed as Condition Grade 1
WW Gravity	ABS	Assessed as Condition Grade 2
WW Rising	Asbestos Cement (AC)	Assessed as Condition Grade 5
SW	Cast Iron (CI)	Assessed as Condition Grade 2
WW Gravity	Cast Iron (CI)	Assessed as Condition Grade 1

Water Type(s)	Material Type(s)	Condition Grade Method
DW	Galvanised Steel	Assessed as Condition Grade 5
DW	Steel <20 years old	Assessed as Condition Grade 1 using expected base life of 120 years
DW	Steel >20 years old and installed during or after 1900	Assessed as Condition Grade 2 using expected base life of 120 years
DW	Steel installed prior to 1900	Assessed as Condition Grade 5 using expected base life of 120 years
WW Gravity	Steel Cement Lined (ST-CC)	Assessed as Condition Grade 1
WW Rising	Steel Cement Lined (ST-CC)	Assessed as Condition Grade 2
SW	Stoneware (SN)	Distribution of condition grades in line with results from CCTV inspections

Where assessed grades were available (from CCTV structural condition grades and DW CI p-CAT assessments), these condition grades were prioritised over those predicted by the models.

2.7 Analysis

The gravity and pressure models were applied to generate an assessed condition grade for the WDC assets, and the unique COMP Key was used to add these grades to the original dataset supplied by WDC. Additional fields were added for the purpose of analysing the data, as detailed in Table 19.

Table 19 Additional calculations added to WDC data

Column Name	Description
Install Decade	Using the Install Year as a lookup value, assigns each asset to a decade
Age in 2025	As this assessment was run in 2025, this calculates the age of each asset at the time of the assessment
Age Bracket 10y	Using the calculated Age in 2025, this groups the assets into 10 year age bands
Age Bracket 20y	Using the calculated Age in 2025, this groups the assets into 20 year age bands
AC Watermain High Pressure Group	This groups DW AC assets into groups based on the High-Pressure value. If the asset has no High-Pressure data, then the diameter is used to identify the Default Pressure using the methodology in the Pressure AC DW model

Methodology

Column Name	Description
Confidence Grade	If the assessed condition grade was from observational data (CCTV structural grade or DW CI p-CAT assessment), then the confidence grade is B. If the assessed condition grade is due to the application of the model, then the confidence grade is D.

2.7.1 Condition Grade Scores

Table 20 details the data used in determining the final assessed condition grade of the assets.

Table 20 Additional calculations added to WDC data

Column Name	Description
Static Condition Grade	Assets that were assessed without Predictor or a Decision Tree
CCTV Structural Grade	Condition grades derived from CCTV assessments
DW CI pCAT Assessed Grade	Condition grades derived from p-CAT assessments
Predicted Condition Grade	Condition grades derived from the Predictor models and Decision Tree methods
Assessed Condition Grade	The final condition grade used in the data analysis. If an asset has a condition grade from a CCTV or p-CAT assessment, then this is used as the assessed condition grade. If an asset does not have a CCTV or p-CAT condition grade, but it does have a static condition grade, then this is used as the assessed condition grade. If an asset does not have a CCTV, p-CAT, or static condition grade, then the predicted condition grade is used as the assessed condition grade.

3 Results

Condition grading results from the preliminary condition grading assessment are summarised by water type. Quantities represent the total number of assets for each Condition Grade. Assets from all WDC townships are included in the total figures for each condition grade.

A summary of total asset count within each condition grade is summarised in the following sections: first with all water types combined, then followed by separate summaries for wastewater pressure, wastewater gravity, stormwater and drinking water assets.

3.1 Combined Network Summary

Table 21 summarises the assets by water type and the Likelihood of Failure (LoF) score provided by WDC. Table 22 presents an overview of all assets by water type and assessed condition grade. Table 23 combines the data for LoF and assessed condition grade and presents the percentage of assets within each category.

Table 21 Count of assets by original Condition Grade score (Likelihood of Failure (LoF) supplied by Waitaki District Council) for all water types

Water Type	1	2	3	4	5	Sum
Sewer Main	974	1,330	194	589	0	3,087
Storm Main	370	652	112	6	16	1,156
Water Main	5,831	2,274	3,500	556	62	12,223

Table 22 Count of assets by assessed Condition Grade for all water types

Water Type	1	2	3	4	5	Sum
Sewer Main	768	1024	581	434	280	3,087
Storm Main	295	424	187	162	88	1,156
Water Main	4,263	3,038	1,087	2,977	858	12,223

Table 23 Percentage comparison of CG and LoF scores for all water types

Water Type	LoF or CG	1	2	3	4	5
Sewer Main	LoF	31.6%	43.1%	6.3%	19.1%	0.0%
	Assessed CG	24.9%	33.2%	18.8%	14.1%	9.1%
Storm Main	LoF	32.0%	56.4%	9.7%	0.5%	1.4%
	Assessed CG	25.5%	36.7%	16.2%	14.0%	7.6%
Water Main	LoF	47.7%	18.6%	28.6%	4.5%	0.5%
	Assessed CG	34.9%	24.9%	8.9%	24.4%	7.0%

As shown in Table 23 the assessed condition has generally seen a reduction in the proportion of the assets in all three waters for grades 1 and 2 and an increase in the number of assets with grades 3 to 5, overall showing a greater level of deterioration than was previously assessed. The proportion of all 3-waters pipes in very poor condition (Grade 5) has increased from an average of 0.5% to 7.4%.

A comparison between the condition grades that have been assessed as part of this work and the original condition grade(Likelihood of Failure) provided by WDC in the *Predictive Condition Model 20250131* shown as the percentage of assets within each pipe type and material is provided in Table 35 within Appendix A.

3.2 Wastewater (Pressure) Summary

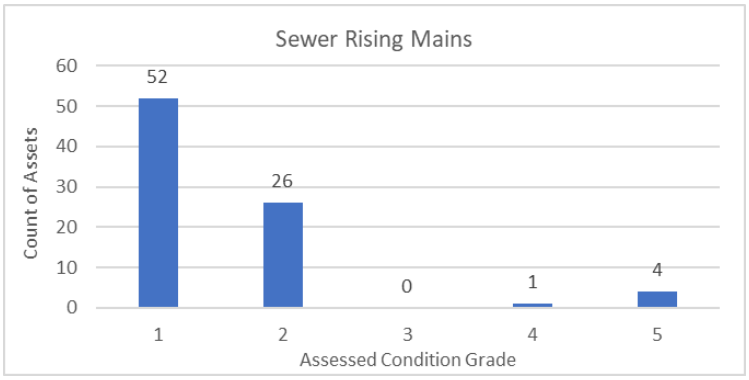
Table 24 shows the percentage of wastewater rising mains by material type and assessed condition grade. While 100% of the AC and CI assets were assessed as condition grade 5, Graph 5 shows that this includes only 4 assets, and that the majority (78) were assessed as condition grades 1 and 2. Graph 6 presents the total length in km of the assets, illustrating that the majority of the wastewater rising main length is assessed as condition grade 2.

Table 24 Wastewater Rising Mains: Percentage of assets by Material Type and assessed Condition Grade

Material Type	**1**	**2**	**3**	**4**	**5**
Asbestos Cement (AC)	0%	0%	0%	0%	100%
Cast Iron (CI)	0%	0%	0%	0%	100%
Polyethylene (PE)	75%	25%	0%	0%	0%
Polyvinyl Chloride (PVC)	20%	70%	0%	10%	0%
Steel Cement Lined (ST-CC)	0%	100%	0%	0%	0%
Combined Sewer Rising Mains	63%	31%	0%	1%	5%

Results

Graph 5 Wastewater Rising Mains: Number of assets by assessed Condition Grade



Graph 6 Wastewater Rising Mains: Total length of assets by material type and assessed Condition Grade

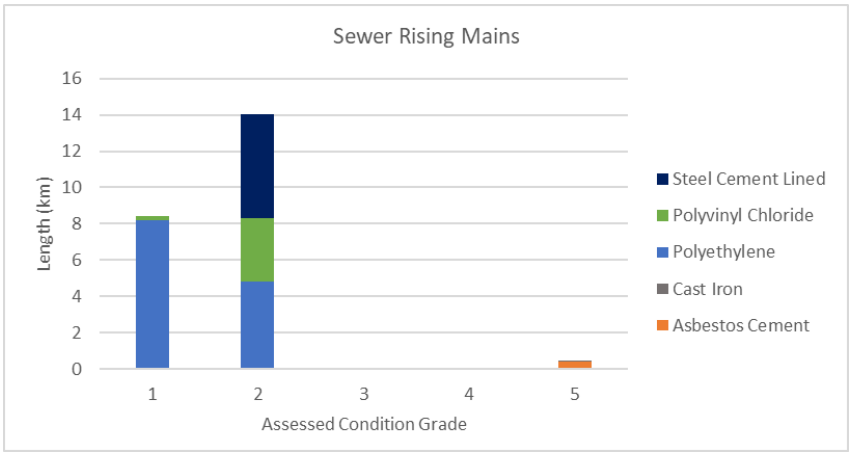


Table 25 Wastewater Rising Mains: Percentage of assets by total length and assessed Condition Grade

Material Type	**1**	**2**	**3**	**4**	**5**
Asbestos Cement (AC)	0.0%	0.0%	0.0%	0.0%	100.0%
Cast Iron (CI)	0.0%	0.0%	0.0%	0.0%	100.0%
Polyethylene (PE)	63.0%	37.0%	0.0%	0.0%	0.0%
Polyvinyl Chloride (PVC)	5.9%	93.9%	0.0%	0.2%	0.0%
Steel Cement Lined (ST-CC)	0.0%	100.0%	0.0%	0.0%	0.0%
Combined Sewer Rising Mains	36.8%	61.3%	0.0%	0.0%	2.0%

Results

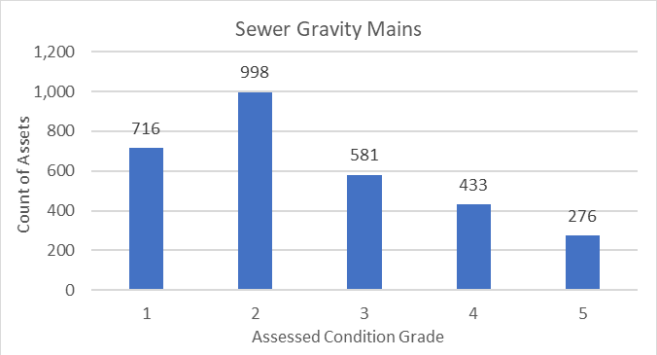
3.3 Wastewater (Gravity) Summary

Table 26 shows the percentage of wastewater gravity mains by material type and assessed condition grade. Most material types had the majority of assets assed as condition grades 1 – 3, however over half of the EW assets were assessed as condition grade 4 or 5. Overall, 9% of the assets were assessed as condition grade 5. Graph 7 shows that this is comprised of 276 assets. Graph 7 and Graph 8 show that the distribution of assets across the condition grades is similar for both the count of assets and the percentage of length in km. This is supported by the summary data in Table 27.

Table 26 Wastewater Gravity Mains: Percentage of assets by Material Type and assessed Condition Grade

Material Type	1	2	3	4	5
ABS	0%	100%	0%	0%	0%
Asbestos Cement (AC)	12%	45%	35%	5%	2%
Cast Iron (CI)	100%	0%	0%	0%	0%
Earthenware (EW)	4%	18%	22%	31%	26%
Polyethylene (PE)	18%	82%	0%	0%	0%
Polyvinyl Chloride (PVC)	69%	22%	4%	4%	1%
Reinforced Concrete (RC)	8%	47%	24%	15%	6%
Relined (RL)	100%	0%	0%	0%	0%
Steel Cement Lined (ST-CC)	100%	0%	0%	0%	0%
Combined Sewer Gravity Mains	24%	33%	19%	14%	9%

Graph 7 Wastewater Gravity Mains: Number of assets by assessed Condition Grade



Results

Graph 8 Wastewater Gravity Mains: Total length of assets by material type and assessed Condition Grade

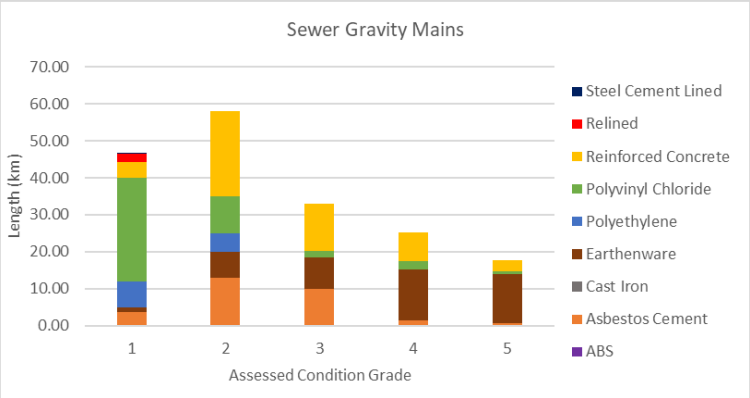


Table 27 Wastewater Gravity Mains: Percentage of assets by total length and assessed Condition Grade

Material Type	1	2	3	4	5
ABS	0.0%	100.0%	0.0%	0.0%	0.0%
Asbestos Cement	12.9%	44.9%	34.7%	5.3%	2.2%
Cast Iron	100.0%	0.0%	0.0%	0.0%	0.0%
Earthenware	2.6%	16.4%	19.5%	31.1%	30.3%
Polyethylene	59.4%	40.6%	0.0%	0.0%	0.0%
Polyvinyl Chloride	65.2%	23.2%	4.3%	5.7%	1.6%
Reinforced Concrete	8.4%	45.7%	24.8%	15.2%	6.0%
Relined	100.0%	0.0%	0.0%	0.0%	0.0%
Steel Cement Lined	100.0%	0.0%	0.0%	0.0%	0.0%
Combined Sewer Gravity Mains	25.8%	32.2%	18.2%	14.0%	9.8%

3.4 Stormwater Summary

Table 28 and Graph 9 illustrate the distribution of stormwater assets across assessed condition grade by material type. Table 29 and Graph 10 present the total length of stormwater mains across assessed condition grade by material type. These show that the distribution of assets by number and total length is similar, with the largest proportion for both being assessed as condition grade 2. Graph 10 also highlights that the majority of the total length of SW assets are reinforced concrete.

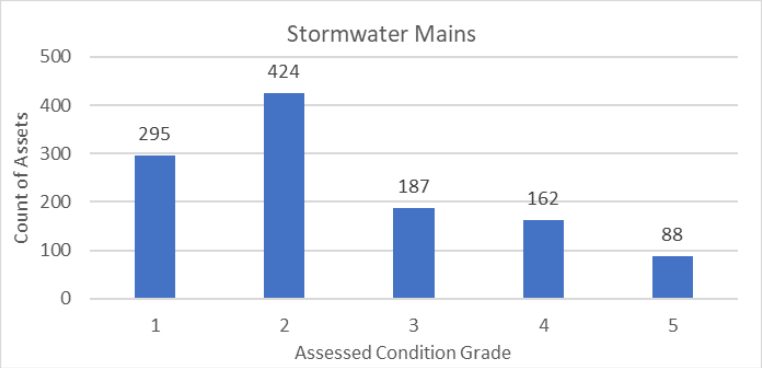
Table 28 Stormwater Mains: Percentage of assets by Material Type and assessed Condition Grade

Material Type	1	2	3	4	5
Asbestos Cement (AC)	45%	35%	5%	15%	0%

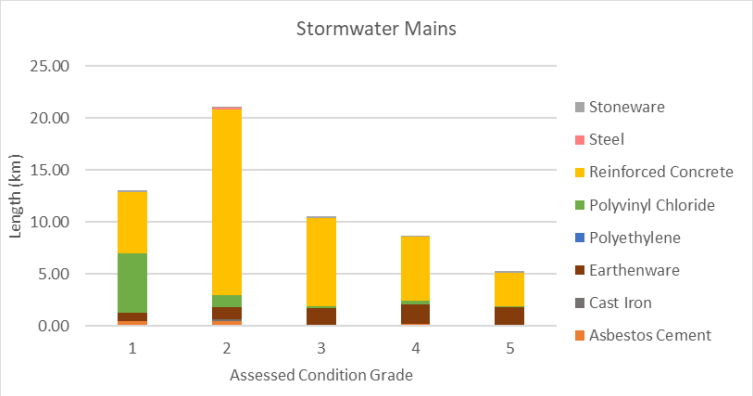
Results

Material Type	1	2	3	4	5
Cast Iron (CI)	0%	100%	0%	0%	0%
Earthenware (EW)	8%	20%	23%	29%	21%
Polyethylene (PE)	100%	0%	0%	0%	0%
Polyvinyl Chloride (PVC)	78%	15%	2%	3%	2%
Reinforced Concrete (RC)	16%	45%	19%	14%	6%
Steel (ST)	0%	100%	0%	0%	0%
Stoneware (SN)	28%	6%	11%	17%	39%
Combined Stormwater Mains	26%	37%	16%	14%	8%

Graph 9 Stormwater Mains: Number of assets by assessed Condition Grade



Graph 10 Stormwater Mains: Total length of assets by material type and assessed Condition Grade



Results

Table 29 Stormwater Mains: Percentage of assets by total length and assessed Condition Grade

Material Type	1	2	3	4	5
Asbestos Cement (AC)	42.9%	38.2%	4.8%	14.0%	0.0%
Cast Iron (CI)	0.0%	100.0%	0.0%	0.0%	0.0%
Earthenware (EW)	10.0%	16.8%	22.9%	26.3%	23.9%
Polyethylene (PE)	100.0%	0.0%	0.0%	0.0%	0.0%
Polyvinyl Chloride (PVC)	77.5%	15.0%	1.9%	3.8%	1.8%
Reinforced Concrete (RC)	14.2%	42.9%	20.4%	14.9%	7.6%
Steel (ST)	0.0%	100.0%	0.0%	0.0%	0.0%
Stoneware (SN)	27.4%	10.5%	18.1%	16.5%	27.5%
Combined Stormwater Mains	22.3%	36.0%	17.9%	14.8%	9.0%

3.5 Drinking Water Summary

Table 30 Table 31 Graph 11 Graph 12 Graph 13 Graph 14

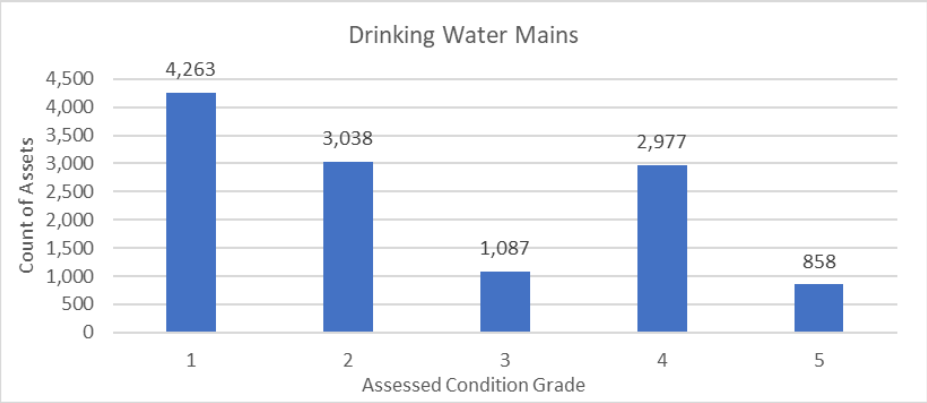
Table 30 and Graph 11 summarise the distribution of drinking water mains across assessed condition grades by material type, showing that the condition grade with the largest number of assets is condition grade 1, followed by grade 2. Table 31 and Graph 12 present the total length of assets by condition grade and material type and show that the condition grade with the highest total length is grade 2 followed by grade 4. Graph 12 also illustrates that the material type with the highest total length is PE.

Table 30 Drinking Water Mains: Percentage of assets by Material Type and assessed Condition Grade

Material Type	1	2	3	4	5
Asbestos Cement (AC)	1%	3%	19%	26%	51%
Cast Iron (CI)	10%	61%	22%	6%	1%
Ductile Iron (DI)	100%	0%	0%	0%	0%
Galvanised Steel (GALV)	0%	0%	0%	0%	100%
Polyethylene (PE)	36%	24%	9%	32%	0%
Polyvinyl Chloride (PVC)	52%	35%	3%	7%	3%
Steel (ST)	13%	61%	0%	0%	26%
Combined Drinking Water Mains	35%	25%	9%	24%	7%

Results

Graph 11 Drinking Water Mains: Number of assets by assessed Condition Grade



Graph 12 Drinking Water Mains: Total length of assets by material type and assessed Condition Grade

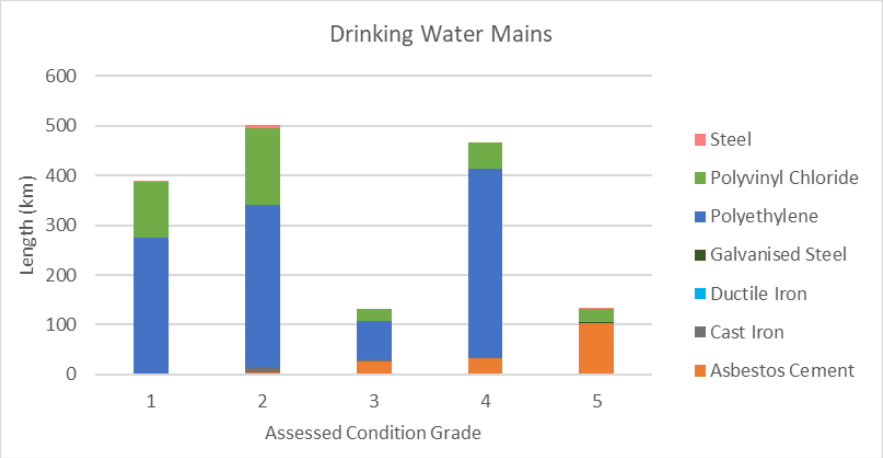


Table 31 Drinking Water Mains: Percentage of assets by total length and assessed Condition Grade

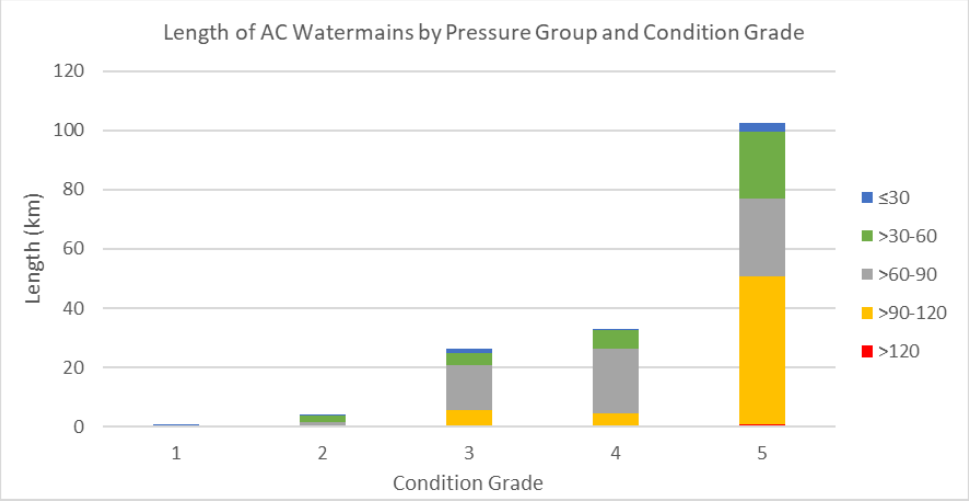
Material Type	1	2	3	4	5
Asbestos Cement (AC)	0.6%	2.3%	15.9%	19.6%	61.6%
Cast Iron (CI)	5.0%	61.4%	27.5%	6.0%	0.0%
Ductile Iron (DI)	100.0%	0.0%	0.0%	0.0%	0.0%
Galvanised Steel (GALV)	0.0%	0.0%	0.0%	0.0%	100.0%
Polyethylene (PE)	25.9%	30.9%	7.3%	35.9%	0.0%
Polyvinyl Chloride (PVC)	30.2%	41.5%	6.4%	14.6%	7.3%
Steel (ST)	0.3%	88.3%	0.0%	0.0%	11.4%

Results

Material Type	1	2	3	4	5
Combined Drinking Water Mains	23.9%	34.3%	6.9%	27.9%	7.0%

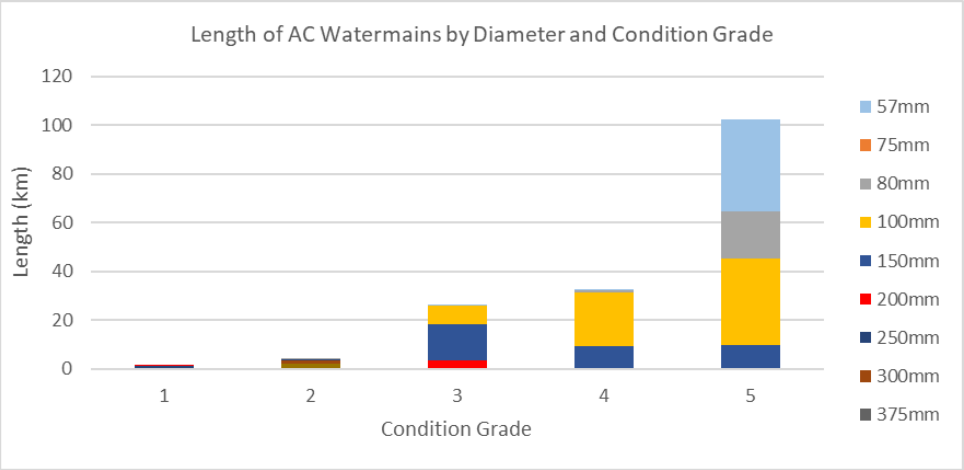
Graph 12 shows that AC assets have a significant amount of total network length, and Table 30 highlights that the majority of AC assets are assessed as condition grade 4 and 5. Graph 13 and Graph 14 are included to show the distribution of AC assets across condition grades by pressure (Graph 13) and diameter (Graph 14). These graphs show that the majority of assets with a condition grade of 5 have a high-pressure value between 90-120m. However, assets with a high-pressure value of 60-90m are evenly distributed between condition grades 3-5. Graph 14 shows that the majority of assets with a condition grade of 5 have a diameter of 100mm or less. The proportion of assets with a diameter of 150mm or greater was higher in grades 3 and 4 and was the majority in grades 1 and 2.

Graph 13 Length of AC watermains by Pressure Group and Condition Grade



Results

Graph 14 Length of AC watermains by Diameter and Condition Grade



4 Recommendations

The following sets out the recommendations to further improve the confidence and WDC understanding of the network asset condition.

4.1 Data

4.1.1 Pipe Material Confidence

The data supplied by WDC for the wastewater, stormwater and drinking water linear assets is significantly complete. The data review process prior to the condition assessment identify only a very small number (<2% of all assets) of anomalies with the pipe material installation dates for some of the pipe materials and also low and very low material data confidence for pipes that have a high likelihood of failure (refer to section 2.2.3 Pipe Materials)

The following close out the small number of anomalies identified in Table 7 and further enhance the pipe material reliability it is recommended that WDC collect information and update or confirm the pipe materials (along with other attribute data, e.g., pipe diameter) through opportunistic data collection carried out as part of BAU, (e.g., as part of reactive maintenance or planned inspections)

4.1.2 Pipe Base Life

The Assessment has identified recommended changes to the current WDC base lives for some the materials, in particular within the pressure pipe summarised as follows:

Plastic Pressure Pipe (drinking water and wastewater rising mains) – recommend adjusting the base lives to the values used within this assessment as set out in Table 10 Expected Service Life of Plastic Pipes

Asbestos Cement Pressure pipe (wastewater rising mains) - recommend adjusting the base lives from current 120 years to 40 years which is the expected life set out in the AC Manual. Noting that there are only 3 AC wastewater rising mains and these are currently assessed as grade 5 (very poor). There is no recommendation to change the base lives for the drinking water pipes at this time.

Cast Iron pressure pipe – Recommend, (dependent on the results of recommended inspections/assessments) adjusting the current base life of 150 years to 200 years.

There is no recommendation to change other pipe base lives at this time.

Recommendations

4.2 Previous Inspections

4.2.1 Existing CCTV inspection of Gravity Pipe

The CCTV inspections that have been completed between 2001 and 2024 assessed the condition approximately 17km of stormwater and wastewater gravity pipe in poor or very poor condition (Grade 4 or 5). The grades from the CCTV inspection have been included within the assessment results in preference to predicted assessment, as described within the assessment methodology. However, while the grades the CCTV inspection provide a higher confidence than the predicted grades, they should not be considered sufficiently reliable to justify renewal of the pipes without further assessment of the CCTV inspection data being undertaken to confirm the pipe condition. It is generally expected that following engineering assessment of the CCTV inspections that the quantity assessed as poor or very poor will reduce allowing deferral of the pipe renewal into the future or confirming with high confidence the justification of the pipe renewal. 7km of the 17km assessed as in poor condition have a high or very high criticality (**Error! Reference source not found.**). It recommended that where CCTV videos are available that an engineering assessment of the pipes with a CCTV assessed grade of 4 or 5 (17km) is undertaken to confirm the pipe condition with a focus prioritised on the pipes with a consequence of failure grade of 4 and 5 (the most critical pipes) as these would be expected to be the first assets to be considered for renewal.

Table 32 Total Length of pipes (m) with COF 4 and 5 and Confidence Grade B

Water Type	Material Type	Condition Grade 4	Condition Grade 5	Total Length (m)
WW Gravity	Combined	2,626	2,386	5,012
	CC	1,162	169	1,331
	EW	1,465	2,110	3,574
	PVC		107	107
SW	Storm Main	1,055	1,128	2,182
	CC	828	850	1,677
	EW	227	203	430
	SN		75	75
Total Length (m)		**3,681**	**3,514**	**7,195**

A recommended engineering assessment on the previous CCTV inspections that are available is could be commenced within December 2025 and completed prior to April 2026.

Recommendations

4.2.2 Existing Assessment of Cast Iron Pipes

The assessment of the condition of the cast iron pipes previously inspected using p-CAT technology was based on a percentage of remaining wall loss, resulting in a confidence grade of only B. It is recommended to undertake further assessment of these pipes (shown in Table 33) utilising the remaining wall thickness measurements available from the p-CAT and utilising the modelled network pressure with an allowance for surge to confirm the remaining pipe structural capacity and remaining life.

It is expected that this analysis could be undertaken completed within December 2025. to be able to be complete prior to April 2026.

The Outcomes of both the engineer assessment of the CCTV inspections and CI watermains should be integrated into the desktop assessment to improve data confidence for condition grading of previously inspected assets. The refined condition grading data should be referenced in the response to the DIA Review as appropriate.

Table 33 COF 4 and 5, Confidence Grade B, Cast Iron water mains

Assessed Condition Grade	2	3	Sum
CI Water Main length (m)	2,684	3,581	6,265

4.3 Future Inspections

Future pipe inspections are recommended to improve confidence of pipe condition grading and inform evidence-based renewals based on a risk-based approach. Future inspections of both gravity and pressure pipes should where appropriately include engineering assessment to confirm failure modes, remaining useful life and recommended the most appropriate interventions including maintenance, repair, relining or replacement.

These recommendations are longer-term (beyond June 2026) and short-term (prior to April 2026) to help inform the updates to the WSDP.

4.3.1 Long-term horizon (post June 2026)

Development of a prioritised annual asset inspection programme for wastewater, stormwater and drinking water assets is recommended. Pipe information including predicted pipe condition, criticality and other asset attributes are assessed to create a prioritised annual inspection programme Pipes with very poor condition and high criticality

are generally prioritised for inspection (and renewal). The quantity of these assets is identified in **Error! Reference source not found.**.

Table 34 Total Length of pipes (m) with COF 4 and 5, Assessed Condition Grades 4 and 5, and Confidence Grade D

Water Type	Material Type	Condition Grade 4	Condition Grade 5	Total Length (m)
WW Gravity	Combined	4,718	2,165	6,883
	AC	260		260
	CC	1,251	736	1,988
	EW	2,508	1,301	3,809
	PVC	698	128	826
WW Rising	Combined		296	296
	AC		272	272
	CI		24	24
Storm Main	Combined	1,566	1,179	2,745
	CC	1,224	604	1,827
	EW	272	525	797
	PVC		10	10
	SN	70	42	111
Water Main	Combined	35,281	16,837	52,118
	AC	12,538	13,661	26,199
	CI	933	2	935
	GALV		170	170
	PE	15,694*	244*	15,938*
	PVC	6,116	2,760	8,876
Total Length (m)		**41,564**	**20,478**	**62,042**

**WDC have already identified the planned renewal of smaller diameter PE pipelines within their renewal strategy as is evidence by recorded high rates of failure.*

It is recommended that inspection prioritisation, scoping and technical support (if required) is completed within FY25-26 so WDC can inform their asset condition inspection programme for FY26-27.

4.3.2 Short-Term Horizon (Prior to April 2026)

It is noted that the desktop condition assessment has identified significantly more AC drinking water pipes with a predicted Condition Grade of 5 than has been previously assessed by WDC based on very low failure rates having been observed for 100/150mm diameter AC pipe. As described in section 2.3 (Approach, Limitations and Assumptions to Condition Assessment) there are limitations to on the confidence that can be achieved through desktop assessment models. Higher confidence in the pipe condition can only be addressed through undertaking pipe condition investigations. Given the large number of AC

equal or greater than 100mm in diameter pipe with a predicted grade 5, (45km) a cohort sampling of a size sufficient to provide improved confidence as to whether the condition grade 5 and therefore the required level of renewal is justified should be undertaken. It should be noted that and as can be seen in graph 14 (page 61) that the majority of the AC pipes with grade 5 are small diameter (<100mm) which are currently already identified in the Interim Oamaru Urban Water Main Renewals Strategy for renewal commencing in year 3 to 4. These smaller diameter pipes are not recommended for further investigation as based on the reported failure rates the poorer assessed condition is in line with evidence available from WDC.

Some cast iron pipe was previously considered to be more deteriorated than the assessments completed have suggested as most of the cast iron pipe are approaching the current base life of the pipe. It is recommended undertaking some field inspections of cast iron drinking water pipes within the townships that have not been previously inspected to confirm that the rate of deterioration is slower than previously expected and improving confidence on the timing of pipe renewals.

Detailed scope for asset inspection prioritisation, scoping and technical support as noted in Section 1.3.2 will be prepared in a separate document for WDC consideration.

4.4 Department of Internal Affairs Review

It is recommended that outcomes from this desktop condition assessment are considered with other information to inform the WDC response to DIA review comments on the 2025 Water Services Delivery Plan.

Recommendations

Appendix A Comparison between Assessed Condition and the Original WDC Likelihood of Failure Grades

Where the assessed Condition Grage (CG) are lower than the corresponding LoF score these are highlighted in blue, and higher scores are highlighted in amber. Where there is no change there is no highlight.

Table 35 Percentage comparison of CG and LoF scores for material types

Water Type	Material Type	LoF Score					Assessed CG				
		1	2	3	4	5	1	2	3	4	5
WW	Combined	31.6%	43.1%	6.3%	19.1%	0.0%	24.9%	33.2%	18.8%	14.1%	9.1%
WW Gravity	Combined	29.8%	44.2%	6.5%	19.6%	0.0%	23.8%	33.2%	19.3%	14.4%	9.2%
WW Gravity	ABS	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%
WW Gravity	AC	5.0%	95.0%	0.0%	0.0%	0.0%	11.9%	45.3%	35.2%	5.5%	2.1%
WW Gravity	CC	10.0%	86.3%	3.7%	0.0%	0.0%	7.8%	46.8%	24.4%	15.5%	5.5%
WW Gravity	CI	100.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%
WW Gravity	EW	0.1%	7.0%	20.0%	72.8%	0.0%	4.0%	17.8%	21.8%	30.5%	26.0%
WW Gravity	PE	100.0%	0.0%	0.0%	0.0%	0.0%	18.4%	81.6%	0.0%	0.0%	0.0%
WW Gravity	PVC	88.0%	11.8%	0.1%	0.0%	0.0%	69.1%	21.6%	4.1%	4.0%	1.2%
WW Gravity	RL	100.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%
WW Gravity	ST-CC	100.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%
WW Rising	Combined	96.4%	3.6%	0.0%	0.0%	0.0%	62.7%	31.3%	0.0%	1.2%	4.8%
WW Rising	AC	66.7%	33.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
WW Rising	CI	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
WW Rising	PE	98.5%	1.5%	0.0%	0.0%	0.0%	74.6%	25.4%	0.0%	0.0%	0.0%
WW Rising	PVC	90.0%	10.0%	0.0%	0.0%	0.0%	20.0%	70.0%	0.0%	10.0%	0.0%
WW Rising	ST-CC	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%
SW	Combined	32.0%	56.4%	9.7%	0.5%	1.4%	25.5%	36.7%	16.2%	14.0%	7.6%
SW	AC	5.0%	95.0%	0.0%	0.0%	0.0%	45.0%	35.0%	5.0%	15.0%	0.0%
SW	CC	24.7%	71.4%	3.4%	0.5%	0.0%	16.2%	45.0%	18.9%	13.8%	6.1%
SW	CI	0.0%	66.7%	33.3%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%

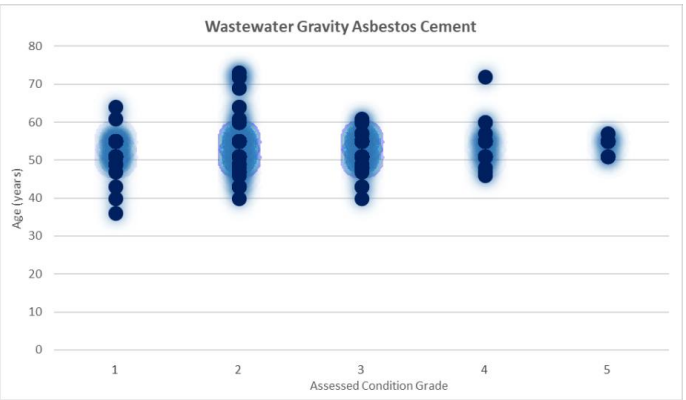
Recommendations

SW	EW	2.1%	40.8%	57.0%	0.0%	0.0%	7.7%	19.7%	22.5%	28.9%	21.1%
SW	PE	100.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%
SW	PVC	94.4%	5.6%	0.0%	0.0%	0.0%	78.3%	15.0%	1.7%	3.3%	1.7%
SW	SN	0.0%	0.0%	0.0%	11.1%	88.9%	27.8%	5.6%	11.1%	16.7%	38.9%
SW	ST	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%
DW	Combined	47.7%	18.6%	28.6%	4.5%	0.5%	34.9%	24.9%	8.9%	24.4%	7.0%
DW	AC	0.8%	38.5%	33.7%	26.6%	0.4%	0.7%	2.9%	19.0%	26.2%	51.2%
DW	CI	8.5%	2.7%	7.1%	81.7%	0.0%	9.8%	60.7%	22.3%	6.3%	0.9%
DW	DI	100.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%
DW	PE	0.0%	0.0%	4.5%	2.3%	93.2%	35.5%	23.8%	8.9%	31.7%	0.0%
DW	PVC	49.9%	10.5%	39.6%	0.0%	0.0%	51.6%	35.5%	3.3%	6.7%	2.9%
DW	ST	68.2%	31.7%	0.0%	0.0%	0.1%	13.2%	60.5%	0.0%	0.0%	26.3%
DW	GALV	18.4%	31.6%	23.7%	0.0%	26.3%	0.0%	0.0%	0.0%	0.0%	100.0%
Combined WW, SW, DW		**43.6%**	**25.8%**	**23.1%**	**7.0%**	**0.5%**	**32.3%**	**27.2%**	**11.3%**	**21.7%**	**7.4%**

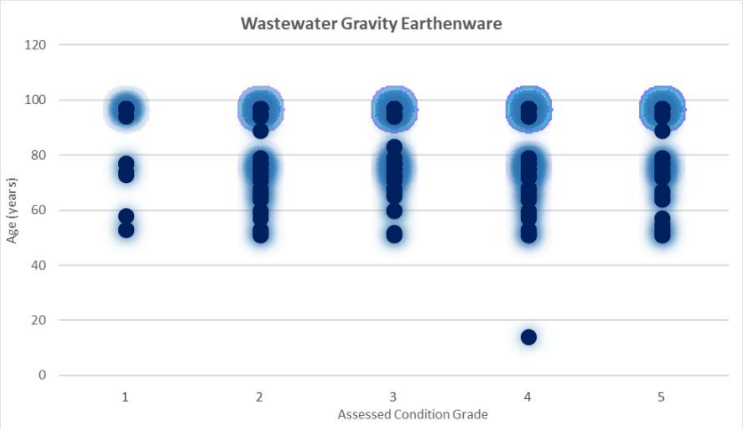
Appendix B Distribution of Condition Grade by Age for Each Material

The following graphs illustrate the distribution of pipe age across assessed condition grades. A larger aura around the data indicates a higher number of assets. For example, the majority of gravity wastewater AC mains assessed as condition grade 1 were between 50-60 years of age.

Graph 15 Wastewater Gravity Asbestos Cement

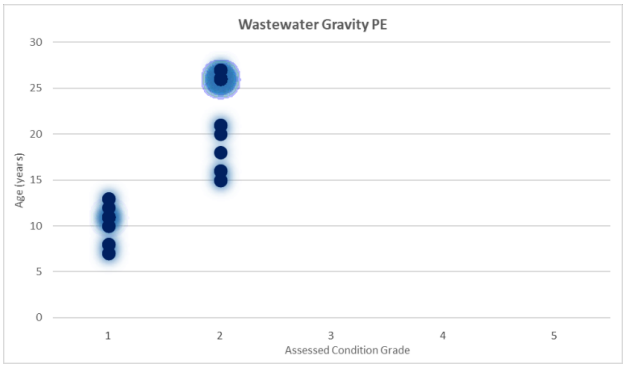


Graph 16 Wastewater Gravity Earthenware

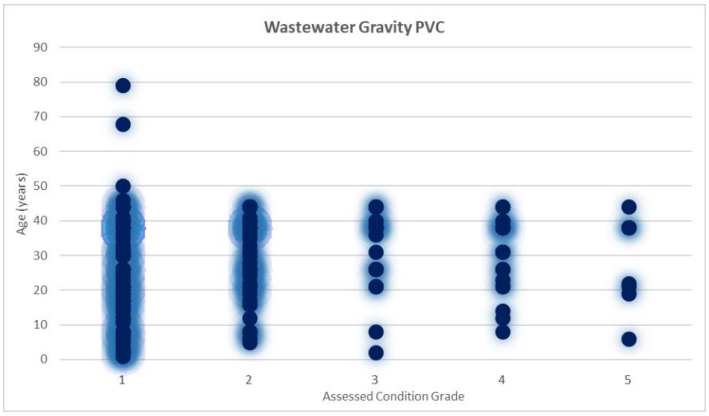


Appendix B

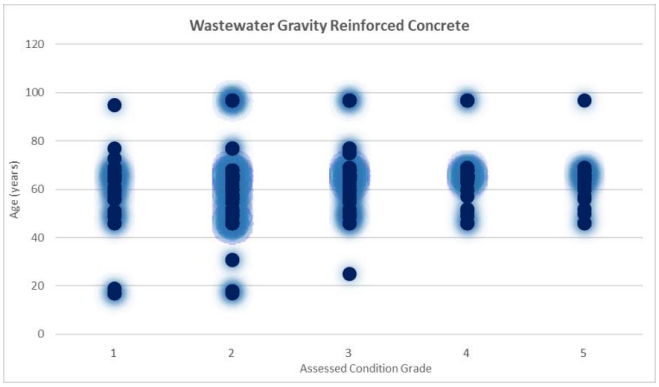
Graph 17 Wastewater Gravity PE



Graph 18 Wastewater Gravity PVC

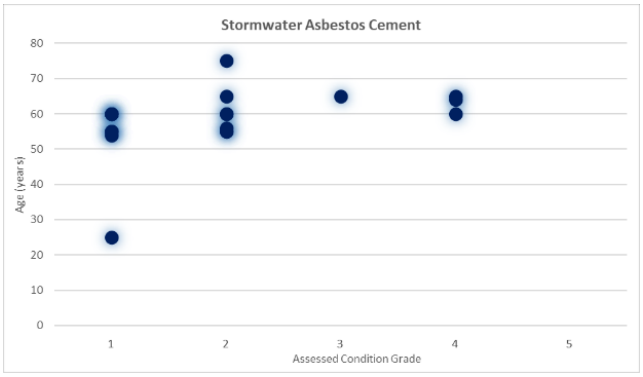


Graph 19 Wastewater Gravity Reinforced Concrete

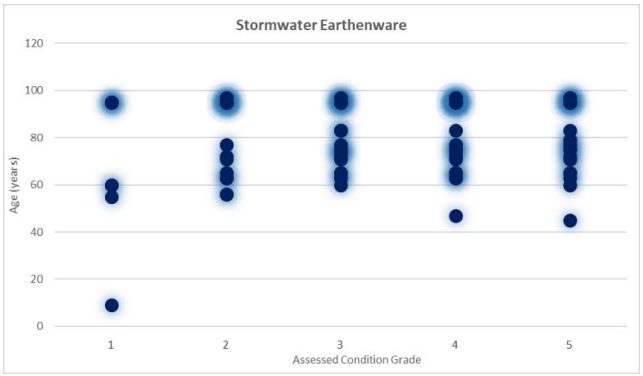


Appendix B

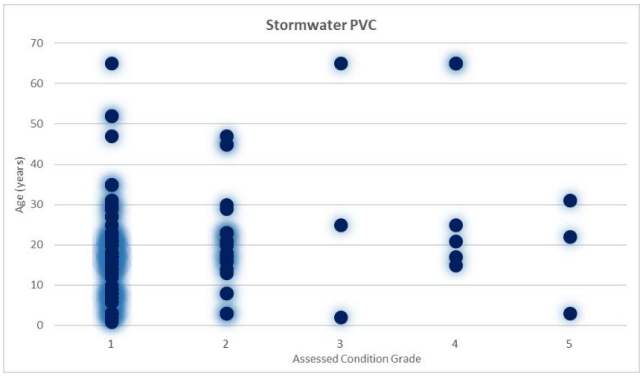
Graph 20 Stormwater Asbestos Cement



Graph 21 Stormwater Earthenware

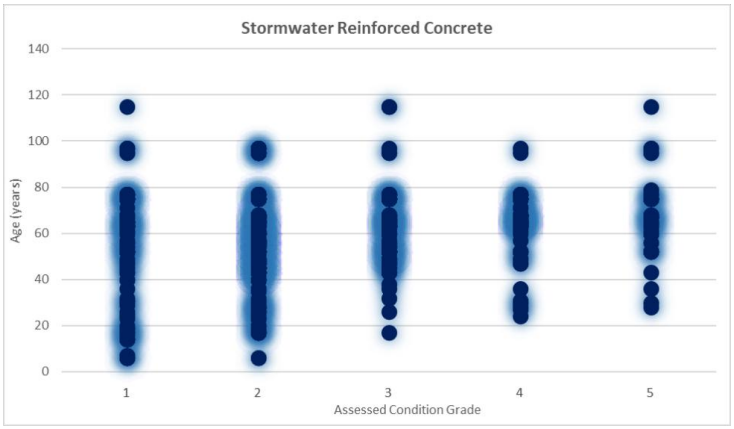


Graph 22 Stormwater PVC

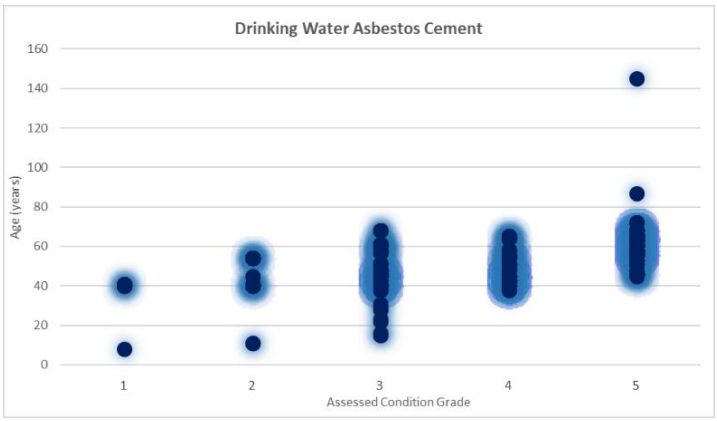


Appendix B

Graph 23 Stormwater Reinforced Concrete



Graph 24 Drinking Water Asbestos Cement



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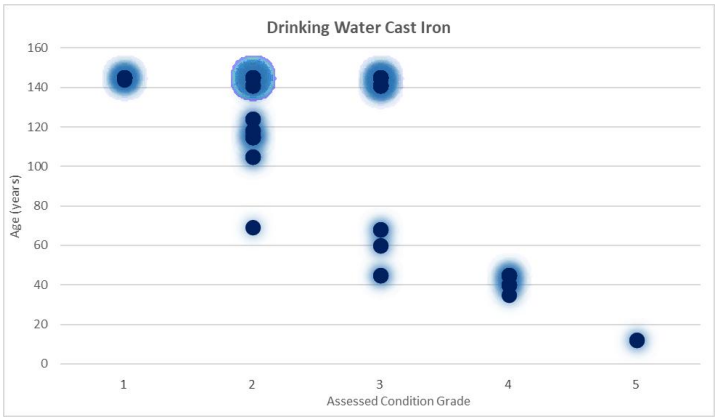
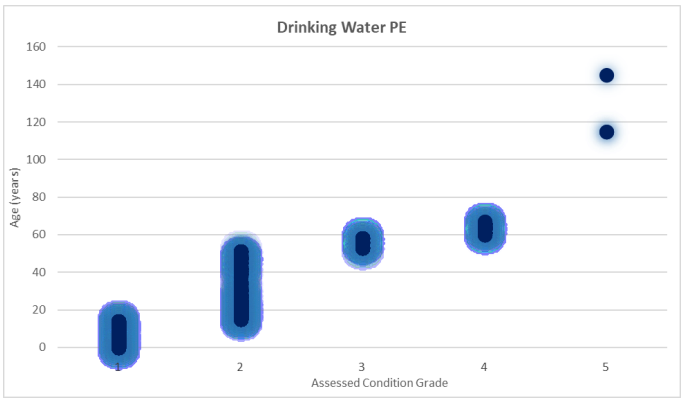
Graph 25 Drinking Water Cast Iron

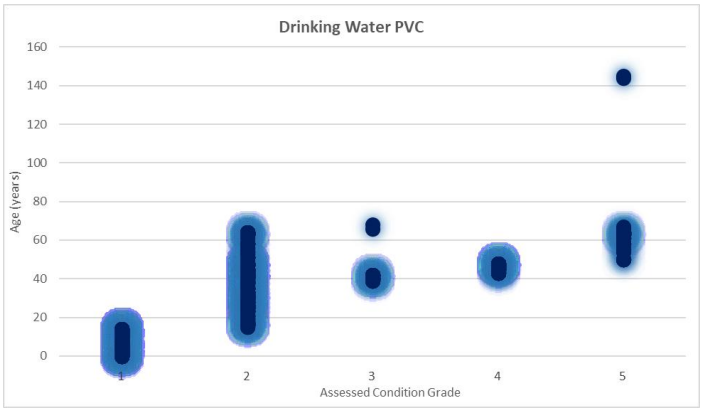


Graph 26 Drinking Water PE

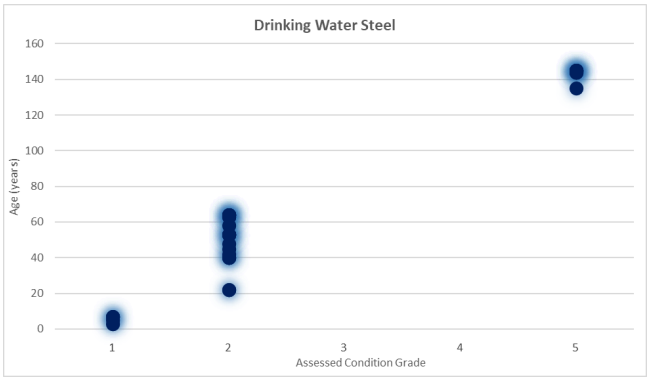


Appendix B

Graph 27 Drinking Water PVC



Graph 28 Drinking Water Steel



PLACEHOLDER - Attachment 3 - Stage 2 scope of works for improving confidence in the condition of critical water networks assets

Option	Original Advantages	Original Disadvantages	Risks / Commentary
Generic Joint Council Controlled Organisation - Applies to both CCO options	○ Lowest cost for water users, therefore more affordable for communities. ○ More efficiency and less duplication of overheads, policy and regulatory costs. ○ Standardised asset management improves planning and efficiency. ○ Shared workforce increases resilience and career opportunities. ○ Larger scale enables better access to expertise, specialists and improved systems. ○ Better procurement opportunities through larger programmes. ○ Certainty of long-term funding enables consistent project delivery. ○ Councils joining the CCO early will contribute to the establishment and design that works for them.	○ Investment prioritisation may vary across communities e.g. growth versus renewals. ○ Joint CCO may independently set charges, that impact on affordability. This will be limited somewhat by regulatory oversight. ○ Potential loss of high-value jobs in small districts. Although local presence is likely. ○ Risk of minimum-cost investment decisions rather than enhancing service levels. ○ Potential reduction in council control. This will be limited somewhat by regulatory oversight. ○ Less capacity to procure services from individual councils, potentially impacting stranded overheads. ○ Risk that stranded overheads cannot be fully managed and add cost to ratepayer. ○ The establishment of a Joint CCO is a significant undertaking and poses financial and delivery risks if not managed appropriately.	○ Opportunity to join may be affected by DIA assessment of WDC WSDP, WDC not seen as an attractive proposition. ○ Negative community response as joint CCO may be seen as contrary to community sentiment (noting small percentage of submissions). ○ Reputational and political risk of WDC changing position again. Positive, factual comms will assist. ○ Failure to manage stranded overheads in the short term will result in higher costs being met by other services. ○ This option is likely to be the most consistent with Simplifying Local Government, and also RM Reform as both reforms are promoting a regional delivery model for LG.

Option	Original Advantages	Original Disadvantages	Risks / Commentary
	○ Independent professional board appointments via council process. ○ Any risks from non-compliance do not sit with Council. ○ Financial separation reduces pressure on council balance sheets. ○ Legislation prohibits the privatisation of water services.		
Option 1 – Southern Joint Council Controlled Organisation	○ Meets financial sustainability requirements according to DIA initial assessment and approved WSDP. ○ District pricing ensures each community pays their costs for service delivery and investment with no cross-subsidisation. ○ Independent assurance confirms benefit estimates are conservative and may be considerably higher. ○ Addition of more councils provides opportunity to	○ Large area to be serviced with limited geographic links to Waitaki. ○ This option was not favoured by the community:14.67% for joint CCO (256 submissions) vs 21.33% for standalone CCO and 53.67% for House Business Unit. Noting the small percentage of the community who made a submission.	○ Joint CCO WSDP has been approved, including statements that Waitaki and Timaru may join. ○ Establishing new entity underway including recruitment of establishment roles. ○ Commitment Agreement serving as the basis for entity establishment documents and processes. ○ There is a risk that the opportunity to join a CCO may be suspended as the CCO focus on establishment becomes critical.

Option	Original Advantages	Original Disadvantages	Risks / Commentary
	realise further efficiencies and reduce customer costs. o Strong alignment between Councils in terms of communities served and services provided. o Rural Water Schemes provided for as a Fourth Water o Opportunity to learn from other joint CCOs who have established earlier		
Option 2 – Stand-alone Waitaki District Council Controlled Organisation (CCO)	Not materially different from Option 3 below (in-house business unit) so not assessed separately		

Option	Original Advantages	Original Disadvantages	Risks / Commentary
Option 3 – Waitaki District Council In-House Business Unit This option involves the council managing its own water services as an internal business unit in Council with financial ringfencing.	○ Minimum change to existing service delivery structure compared to CCO options. Noting there will be changes required to set up ring fencing and meet economic regulatory requirements. ○ Councils retain control over work programs and investment priorities. Maintains localism however, these decisions will be limited somewhat by regulatory requirements. ○ This option is preferred by the community: 53.67% (161 submissions) supported the in-house business unit vs 21.33% for the Standalone CCO and 14.67% for Joint CCO. Noting the small percentage of the community who made submissions. ○ Use of local resources would be supported – noting the challenges to	○ This option is not financially sustainable according to DIA initial assessment. ○ Higher administrative costs and compliance burdens owing to smaller scale. ○ Increased scrutiny from regulatory bodies. ○ Higher risk of financial strain impacting other council services. ○ Limited flexibility to control water charges under economic regulation. ○ Higher water charges than a Joint CCO. ○ Reduced ability to attract and retain a skilled workforce. ○ Cannot access enhanced financing options. ○ Reduced scale impacting delivery of asset management and regulatory requirements. ○ Capability of delivery reduced as competing against larger entities (small player in the market). Council will carry risk relating to any non-compliance.	○ Considerable time and costs delays attempting to get the WSDP approved. ○ Even if approved, the in-house business unit may only be a short-term proposition as Govt reform pushes more regionalisation requiring Councils to collaborate. ○ The longer the delays the less “say” WDC will have in establishment of a joint entity if that is the ultimate decision. ○ If the WSDP is approved there may be affordability issues for the community. ○ There may be political reputational risks of repeated attempts to get the WSDP approved against Govt advice. ○ Capacity, capability and credibility risks have been identified at a national level, especially for smaller entities. ○ Work in other areas of Council may not progress as the focus of Council is not resubmitting the WSDP.

Option	Original Advantages	Original Disadvantages	Risks / Commentary
	attract and retain a skilled workforce. ○ Lowest setup costs of the three options. ○ Negligible financial and delivery risk to implement, noting significant cost increases to the community. ○ Avoids the additional governance structure of Standalone & Joint CCO options. ○ Existing arrangements with Rural Water Schemes retained. ○ No risk of cross subsidisation across other districts. ○ The in-house business unit's sole focus would be Waitaki District.	○ WDC may be required to adopt a different delivery model in the future, removing council's decision rights. ○ Lost first mover advantage to design a delivery model that best meets the needs of the district. ○ Unlikely to be compliant with the Government requirements, including financial sustainability. ○ Councils would struggle to fund other important council projects because they would need to borrow heavily for water infrastructure.	
Option 4 – South Canterbury / CCO	○ Various service delivery relationships exist between Timaru, Mackenzie and Waimate district councils and these three have	○ Project plans and agreements are less developed with project governance and management only recently established.	○ Timaru has a deadline in the approved WSDP of 31 March 2026 for approving any joint arrangements.

Option	Original Advantages	Original Disadvantages	Risks / Commentary
	shareholding in an existing entity. No service delivery is occurring with WDC, although options have been investigated but were not accepted. ○ ECAN is the wastewater regulator for Timaru, Mackenzie and Waimate district councils and five of the WDC schemes. ○ Zone committee memberships align.	○ No Commitment Agreement or similar agreement on key structures and approaches in place. ○ WDC has limited comparability with other Councils. Significant differences in size and scope of services delivered. ○ All four Councils are not aligned as the South Canterbury CCO is not their preferred option. Timaru DC has adopted a standalone CCO, and Waimate DC has adopted an in-house business unit. ○ While financial modelling for the South Canterbury group has been produced, it has not been done on a basis that provides direct comparison with the SWDW work. ○ Stormwater continues to be delivered In-house in Timaru WSDP. ○ No specific recognition of rural water issues due to limited services being delivered by Timaru.	○ Highly unlikely that any partner can meet this deadline as there is no approved framework to join. ○ Little incentive for TDC to join with Waitaki given the very different operating environments / conditions. ○ Waimate are progressing an IBU so unlikely to want to join. ○ No shared boundary between Timaru and Waitaki if Waimate does not join. ○ Given the lack of progress to date, and recent approval of TDC stand-alone WSDP, and Waimate IBU WSDP, unlikely to be sufficient time to reach agreement. ○ Investing valuable time attempting to pursue a different model at this late stage with uncertainty of success may be politically and reputationally damaging. ○ As WDC likely to have to do all the work to advance the arrangement, this would severely impact on Council's ability to focus on other issues, especially the Annual Plan. ○ The impact of the rejection of the Mackenzie WSDP has not been considered or quantified.